RAILROAD GAZETTE

FRIDAY, OCTOBER 20, 1899.

CONTENTS.

ILLUSTRATIONS:	PAGE
One of the Busiest Railroads in the World	722
Brooks 12-Wheel Engines for the Lackawanna	724
The K. C., P. & G. Freight Rate Injunction	726
A Shay Geared Locomotive	728
Progressive Development of English Coupling	728
CONTRIBUTIONS:	
The Westinghouse Friction Draft Gear	721
EDITORIALS:	
Freight Car Capacity and Loading	730
State Ownership of Railroads	730
August Accidents	731
The Right to do Freight Business on Street Railroads	731
EDITORIAL NOTES	730
GENERAL NEWS:	
Locomotive Building	733
Car Building	733
Bridge Building	733

GENERAL NEWS:	PAGE
Meetings and Announcements	735
Personal	736
Elections and Appointments	736
Railroad Construction	736
General Railroad News	738
Traffic	738
MISCELLANEOUS:	
Technical	731
The Scrap Heap	732
Early Rail Making in the United States	721
American Railway Association	723
The Federal Industrial Commission	724
A Derrick Engine with "Simplex" Swinging Gear	724
Train Accidents in the United States in August	725
Embellishment of Station Grounds on the Michigan Central	727
Traffic on "Chicago Day"	728
Some French Rolling Stock Orders	728
Early History of Malleable Cast Iron in the United States	729

Contributions.

The Westinghouse Friction Draft Gear.

Pittsburgh, Oct. 14, 1899.

To the Editor of the Railroad Gazette:

I have read your article and editorial on Metal Draft Beams (issue of Oct. 13), and it is gratifying to observe the interest that has been awakened in a subject the importance of which is measured by the repair track statistics quoted by you. In treating the subject broadly, reference is properly made to the Westinghouse friction draft gear, but it may serve a good purpose to point out that it differs radically from the other devices described, having in fact nothing in common with them except the final object of reducing the destructive effects of strains and blows delivered directly to the draft gear and indirectly to the cars themselves.

There are two directions in which the desired improvements may be sought. One is to reduce the strains and shocks of draft and buffing, which is the principal function of the Westinghouse draft gear, and the other is to provide stronger construction of draft gear and draft beams by the substitution of iron or steel for wood, as proposed in the various other devices illustrated and described in your article. It is, of course, unnecessary to point out that to both increase the strength of the draft appliances in general, and also to reduce the strains to which they are subjected, is highly desirable, and in this communication there is no suggestion in the direction that metal draft beams should not be substituted for wooden ones.

In the description of the Westinghouse draft gear you have correctly stated the principal feature of its construction, which is that the friction element absorbs the shocks and strains both in draft and extension, thereby relieving the car of these strains to a considerable extent. It is apparent, however, that the value of this feature depends entirely upon the degree to which these strains are modified, as a mere trifling reduction in them would not justify the somewhat more costly appliances necessary in connection with this apparatus, and my principal object in writing this communication is, in addition to what you have already stated in regard to it, to give the results of actual tests, showing what has been achieved in the direction in which we are working.

It is evident that if there is no elastic medium, such as springs or other yielding resistance in draft gear, the blow received by it and the draft timbers will be the entire energy required to overcome the momentum of cars coming together, which would be very destructive even at the lowest speeds. It is for the purpose of modifying the effects of these blows and the strains of extension that springs are provided in draft appliances, and the purpose of the friction draft gear is to greatly augment the yielding capacity of this portion of the car construction. To determine exactly the effect produced by the introduction of these yielding elements, careful tests have been made in the following manner:

A standard draft gear with the usual strength was arranged to receive a blow of 150,000 lbs. on the coupler, and the effect of this blow on the follower plate was measured and found to amount to about 125,000 lbs., which is the maxim destructive effort on the draft gear and car. It will, therefore, be seen that the effect of the draft springs was to reduce the initial blow of 150,000 lbs. to 125,000 lbs. before it was transmitted to the draft timbers or car body, the spring element absorbing the other 25,000 lbs.

The Westinghouse friction draft gear was then subjected to the same test under the same conditions, with a maximum destructive effort of 75,000 lbs., or but little more than one-half as much as the standard construction. In one case 25,000 lbs. was absorbed by the spring element, and in the other instance 75,000 lbs. was absorbed by the friction draft gear. There seems to be no doubt that such a result must very materially reduce the destructive tendencies inseparable from the draft appliances of railroad cars and locomotives, and reasonably justify some additional cost of construction.

H. H. WESTINGHOUSE.

Early Rail-Making in the United States.*

By John Fritz, Hon. M. Am. Soc., C. E., etc., etc.

As already stated, the manufacture of rails commenced in 1844, and more rigid and better workmanship was required. The mills were all geared, but the carpenter and millwright was superseded by the machinist. The shafts were now turned up, wheels were bored out, and the mill all fitted up in a more workmanlike manner.

From 1845 to 1856 there were but little improvements made either in machinery or the manner of rolling, except the introduction of the rail-straightening machine, which took the place of the 60-pound sledge and a special man to handle it. When he wanted a rest the works had to come to a standstill until such a time as he was completely rested, sobered up, or restored to health, as the case might be. . . .

The year 1857 was a memorable period in the history of the manufacture of iron, yet it was a more memorable one for me. Up to this time all the rails were rolled on a two-high train, the pile being passed back over the top roll, which was a great waste of time and loss of heat. When the flanges once begin to crack, which was one of the serious troubles, being all the time rolled in one direction, it greatly aggravated the difficulty. The result was that when an imperfection occurred in the flange, with each pass through the rolls the trouble increased, and to such an extent that it was a common occurrence for the flange to tear off the whole length of the rail and wind around the roll, forming what, in rolling-mill parlance, was called a collar, which very generally ended in breaking some part of the train and often the roll.

The iron was both red and cold short and all other shorts, and, in addition to this, would stand but little heat; consequently, the end of the pile which entered the roll first would split and open out like the mouth of an alligator. Then, of course, it would not enter the rolls without force, which was applied with the buggy, using it as a battering-ram. After making several vain attempts to get it to enter the rolls, it very frequently had to be turned end for end. The loss of time taken up in going through all this was such that it was almost an impossibility to get a perfect rail. Had it not been for the use of putty, oxide of iron, and the absence of inspectors, there would have been but few rails shipped. In order to get over the difficulty of the flanges tearing off, we went to quite an expense. Some iron of a better quality was used for the flanges which, in a measure, gave some relief in that direction. But the iron being much stronger, required more heat and greatly increased the difficulty of opening the end of the pile in the first few passes. We were now in a sad dilemma, and something must be done. I was sick at heart and, had it been manly, I would have run away. But during all this time I was giving the subject much consideration and had fully made up my mind that, if a three-high mill could be made to work, the difficulties could all be overcome; besides, I had made up my mind that it was the only true way to roll iron.

I now prepared to suggest building a three-high mill, which I did, and the suggestion was met with a rebuff, which was not unexpected. . . . The officials called a meeting and, after consultation with some practical iron men, decided to put up a geared two-high mill, and by greatly increasing the speed of the rolls the rail would be finished in much less time and consequently at a higher heat, which would prevent the serious trouble of rough and torn flanges. I was ordered to build a new mill, two-high, geared. . . . I most emphatically said I would not do it, as two of the most objectionable features of the present system would still be retained. . . . I consequently concluded that I would do as I had been compelled to do before and many times since—assume authority and go ahead, which I did, and commenced work on the patterns. The drawings had already been practically completed. After the pattern for the housing was well advanced, Mr. E. Y. Townsend, the vice-president, came out to the works, and I informed him of what I was doing. . . . In about a week he came to the works again. This time he was armed with a legal document opposing the spending of the money in the way it was being done. He handed me the document to read, which I did. . . . After some friendly talk on the condition and the importance of the change proposed, he said: "Go ahead and build the mill as you want it." "Do you say that officially?" To which he replied: "I will make it official." And he did so.

When I look back to that talk, which took place on a Sunday morning long years ago, and recall to mind Mr. Townsend and myself, with evidences of failure on all sides and surrounded by the gloom of future uncertainties, I cannot but feel it was a critical period in my own history, as well as that of the Cambria Iron Company. To Mr. E. Y. Townsend belongs the credit not only of the introduction of the three-high rolls, but also for a large share of the subsequent marvelous prosperity of the Cambria Iron Company which followed the introduction of the three-high mill and its many accompanying improvements. . . .

At length the mill was completed, and on the third day of July, 1857, the old mill was shut down for the last time. . . . The starting of the mill was the crucial period. There were no invitations sent out. As the heaters to a man were opposed to the new kind of a mill, we did not want them about at the start. We, however, secured one of the most reasonable of them to heat the piles for a trial. We had kept the furnace hot for several days as a blind. Everything being ready, we charged six piles. About ten o'clock in the morning the first pile was drawn out of the furnace and went through the rolls without a hitch, making a perfect rail. You can judge what my feelings were as I looked upon that perfect and first rail ever made on a three-high train. . . .

Everything worked well up to noon on Saturday, it being our custom to stop rolling at that time. About six o'clock in the evening Mr. Hamilton and myself left the mill, and on our way home congratulated ourselves on the fact that our long line of troubles and disappointments was now over. About an hour later I heard the fire alarm whistle blow, and rushing back to the mill, found it one mass of flames from one end to the other. In less than one hour's time the whole building was burned to the ground, and a story was started that the new mill was a failure and that we had burned the mill to hide our blundering mistakes. The situation of affairs on that Saturday night was such as might appall the stoutest heart. . . . The next day being Sunday, it was devoted to rest and to thinking over the matter. On Monday morning we commenced to clear up the wreck, all the workmen giving a full day towards it, and to begin the work of rebuilding.

In four weeks from that time the mill was running and made 30,000 tons of rails without a hitch or break of any kind, thus making the Cambria Iron Company a great financial success, and giving them a rail plant far in advance of any other plant in the world. This position they held, unquestioned, for both quality and quantity, until the revolutionary invention of Sir Henry Bessemer came into general use.

In the construction of the three-high mill there were many changes and improvements on the old two-high mill. Up to this time the leading spindles had a groove cut in them to weaken them, so that any extra strain coming on the rolls, they would break instead of the rolls; the couplings were made light, so as to act as a kind of a safety valve. Then there was a breaking box placed between the screw and the roll. If there was not one of these safety devices breaking each day, the pattern was made lighter: the result was, some of them were breaking several times daily and were a constant source of annoyance. In building the new mill they were all made so strong that they were not calculated to break. The breaking box on top of the roll was made solid, as they were apt, when they gave way, to break the collars on the rolls, which should, if possible, be avoided. All this change was stoutly opposed by the workmen, and the foremen of the mill were much opposed to this change. . . . I replied that I would rather have a grand old smash-up once in a while than be continually breaking something and keeping the mill standing half the time and the metal wasting in the furnace. The mill made 30,000 tons of rails without a break of any kind, which, at that time, on iron, was nearly a year's work. . . .

In 1864 the Bessemer process was introduced. Its introduction and perfection will ever remain one of the most interesting epochs in the history of the iron business.

As already stated, the forge carpenter and millwright were superseded by the machinist. Immediately after the introduction of the three-high mill all the rail mills in the country were changed; and all the new ones that were built adopted the same plan. In fact, Mr. B. F. Jones, one of the oldest, most practical and successful iron masters in the country, and one of the very first to see the advantages of the system, said to me that it was the commencement of the great improvement which took place in the iron works after 1857 which paved the way for the introduction of the Bessemer process. . . . Altogether, the difficulties we encountered were enough to appal the bravest hearts. My brother George once said that he did not believe

* A few extracts from an address delivered in the Convention Hall of the National Export Exposition, at the Commemorative Meeting of the Mining and Metallurgical Section of the Franklin Institute, on the occasion of the seventy-fifth anniversary exercises of the Franklin Institute.

there was a man that ever went into the Bessemer business, that had charge and was responsible for the result, who did not at times wish he had never gone into it; and, so far as my experience goes, I can fully verify it. And, further, I think if it had not been for the interesting and exciting character of the business, that but few men would have been willing to endure the trouble and anxiety and to bear the labor and danger which he and the workmen were constantly exposed to, long enough to have placed the business on a commercial basis.

I wish to relate a little reminiscence of Mr. Alexander Lyman Holly, who was the consulting engineer of all the Bessemer Steel Works. We had a heat of steel get into the pit followed by a moderate explosion, but no one was hurt. After the pit was cleaned up ready for work again, I was relating to him some our troubles and had just turned around to go away when they let an ingot fall off the car on its way to the rolls, and it was beyond the reach of the crane. I said to him, "There it goes again." He said, "Yes, but that will lie still." . . .

It should not be forgotten that England is the birthplace and home of the "Iron and Steel Institute," and much of our success is due to the information we gained from the invaluable papers read at their meetings and the discussions that followed them. Here I wish to say that I should commit an act of ingratitude, should I fail to give credit to the brave and noble workmen who throughout my long connection with the business have ever stood ready to meet any emergency, no matter what the danger or difficulty might be. . . .

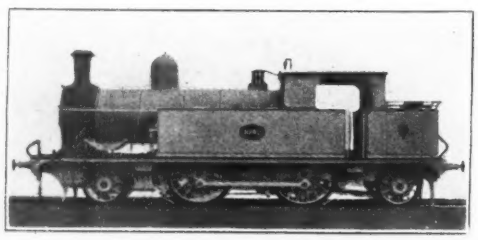
Having already intimated that the United States was not the original home of the iron and steel industry, I will again refer to it. When I look back to my early days in the iron business, long, long ago, probably too long, it brings to mind one of the happiest periods of my life. After my daily labor was done I was free from all care until the next morning. After supper at half-past six, then a simple meal, I returned to the works and helped the puddler, heater, or roller, as the case might be, until about ten o'clock. At that time the practical men—puddlers, heaters, and rollers—were generally foreigners—English and Welsh. After the heats were charged in the furnaces, and while waiting for the charges to become heated, they would get their pipe and sit down on a pile of pig or puddled iron, as it happened to be most convenient, and take their smoke. I would take a seat by them, and then they would tell me about the works in England and describe how their mills were arranged, their system of rolling, the principle and construction of their puddling and heating furnaces, and how to work them. As I spent my nights in assisting them to puddle, heat, and roll, I gained a very general practical knowledge of the manufacture of wrought iron, which soon became of great value to me; and to the nights spent in the works with these hearty and generous workmen I owe much of whatever success I may have attained in after life. For the kind and generous manner in which I was always treated by them they ever have a green spot in my memory. In comparing this happy period of my life with what I have since many times gone through, it might, with propriety, be compared with the "Elysian Fields."

How little do the younger men that have charge of the great iron and steel industries know or even think of the severe mental strain, the great amount of bodily labor, the vexation, the surprises and the disappointments that the men in charge during the perfecting and erection of these vast establishments that are now engaged in the manufacture of iron and steel. . . .

One of the Busiest Railroads in the World.

By E. L. Corthell, M. Am. Soc. C. E.

The Lancashire & Yorkshire Railway embraces in its 556 miles the most densely populated districts of Great Britain and also those districts which may be

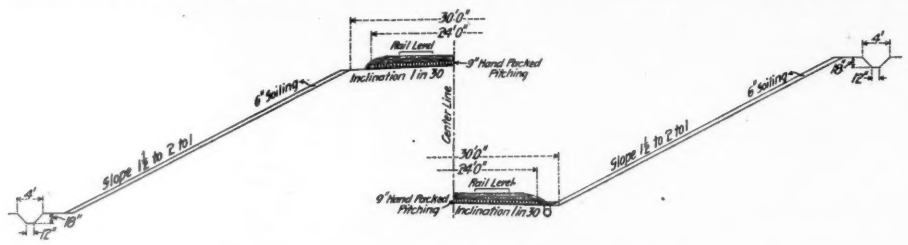


Lancashire & Yorkshire Radial Tank Engine.

Cylinders, 18 in. × 26 in.; drivers, 68 in.; loaded weight, 55 tons, 19 cwt.

considered the best manufacturing districts: Manchester, Bolton, Huddersfield, Bradford and Leeds. The road extends from the west coast of Lancashire to the east coast of Yorkshire, from Fleetwood, Blackpool, Preston, Southport and Liverpool, where it reaches tidewater on the west coast, to Goole and Hull, where it reaches tidewater on the east coast. Examining the system upon the map it suggests the idea of two great spider's webs, one in either of these countries, and connected by a single line, which runs through the backbone of England by means of a tunnel.

It is one of the earliest railroads of England, named at first the Manchester & Leeds Railway, and was incorporated in 1836; this line being 50 miles in length with a 4 ft. 9 in. gage. The railroad was opened July 3, 1839; since that time the gage has been changed to the standard gage of 4 ft. 8½ in., and the system gradually extended until it comprises at present 556½ miles. It, however, works over some foreign lines, making a total of miles



Section of Bank and Cutting—Lancashire & Yorkshire Ry.

worked by its engines 734½, still a very small system in mileage compared with many of those of the United States, and even many of those of Great Britain. In this 556½ miles there are 509 miles of double track, 31½ miles of four-track and 15 miles of single track road, and also some three-track road. There are 735 miles of sidings, single track. In one yard at Sintree, where there are sorting sidings, there are over 22 miles of single track, the yard covering an area of 32½ acres.

It is one of the best built and maintained roads in Great Britain. The standard section of the roadbed in excavation and embankment is shown by the annexed diagram, furnished by the Chief Engineer.

It should be stated that the section and method of construction is not simply theoretical, but is very thoroughly carried out in all its details. Above the

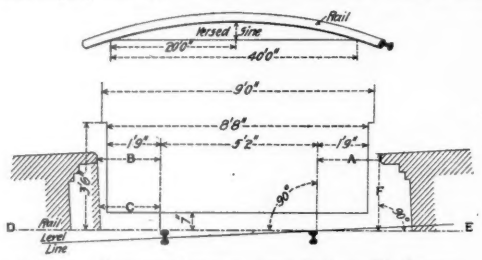


Diagram Showing Distance from Rail to Platform—Lancashire & Yorkshire Ry.

Distance A—on straight, 2 ft. 1 in.
Distance A—on curves of 12 or more chains radius, 2 ft. 2 in.
Distance A—on curves sharper than 12 chains radius, add to 1 ft. 9 in. the versed sine of a 40 ft. chord, plus 2 in.
In all cases the distance A must be measured at platform height, and relative to super-elevation as shown on diagram.
Whatever the distance A may be, the same is to be taken at B and measured as above, except in cases where there is a solid platform (as shown dotted), and there such distance must be taken at 7 in. above rail level, as at C.

"hard packed pitching" the ballast is generally cinders, there being no suitable stone available for top ballast and cinders being plentiful, as the road generally lies in manufacturing districts.

There are 1,936 ties to the mile; the rail and its fastenings are shown on the annexed diagram. The ties are all 9 ft. long, 10 in. wide and 5 in. thick; standard rail, 86 lbs. per yard; the fish plates 18 in. long, weighing 28 lbs., and the weight of each chair on each tie 56 lbs. The usual English wooden taper key is used for holding the rail in position.

The general dimensions of width of cars, height and width of platforms and other detail features of this kind are fully shown on the diagrams of standard structure gage, which is used for all buildings. Many of these features are, as is well known, fixed by the Board of Trade, such as, for instance, the overhang of the platform, which is intended to furnish a place for safety for persons caught between the platforms and the cars. These diagrams, as well as the load diagrams, and the diagrams showing the distance from the rail to the platform, and the diagrams of tunnels and bridges, show the restrictions in regard to dimensions; that is, that the cars from out to out cannot be more than 8 ft. 8 in. between platforms, and the height no more than 13 ft. 6 in. above the top of the rail. The ordinary American freight or passenger car cannot pass over these roads; its width and its length would prevent.

These restrictions furnish one reason why both in height, width and length, the cars on this road, as well as on others, are kept within what would be considered in this country diminutive dimensions. There is another important reason why the ordinary freight cars are of such small capacity; the railroads do really an express business and not a long haul freight business. Merchants purchasing goods in Manchester or Liverpool expect them, and must have them, at their stores for sale the following morning; consequently the lot purchased by them is placed upon one of these small cars, of an average capacity of 9½ tons, in lots that will not average per car of merchandise more than 2½ tons. The maximum ton capacity of the freight cars is 11 tons, their average weight about 5½ tons and the average length over buffers 19 ft.

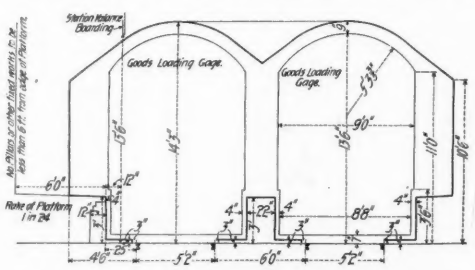
On the line between Manchester and Liverpool an interesting and somewhat troublesome feature exists, by the whole country being mined for coal. The drifts for these mines are at various depths, from 50 ft. to 150 ft. In England the railroads have simply an easement and not an ownership of property, consequently the mine owners have a perfect right to work underneath the railroads. The only way to prevent it is for the railroad company to buy out these rights, which, of course, would be very expensive. It is therefore usual for the coal companies to work as they please underneath the roads and for the roads to maintain as best they can the integrity of their structures. Usually if the seam of coal is, say, 3 ft. in thickness, the entire roadbed and all its structures will settle 2 ft., and the same proportion with greater depth of seams; consequently the engineer in charge of maintenance is in constant anxiety in regard to the structures. At one point on the line between Manchester and Liverpool, where the coal was being mined underneath, a bridge abutment was slowly going over towards the track, breaking away from its wing wall, but the engineer coolly remarked that he was watching it and that when the heading of the mine had advanced a little further probably the abutment would begin to go the other way.

The information in regard to all structural features on the road was furnished to the writer by Mr. W. B. Worthington, Chief Engineer, who accompanied him on the tour of inspection.

Coming now to the rolling stock, about one-half of the engines are of the inside connected type, designed by the Locomotive Superintendent, or General Mechanical Engineer (now General Manager) Mr. J. A. F. Aspinall, who is well known in the United States, from his frequent visits here examining the railroads of this country. The standard freight engine and loaded tender weighs 68 tons 5 cwt., with 15 tons upon the heaviest drivers. There are three pairs of driving wheels coupled. The standard passenger engine and tender loaded weighs 70 tons 10 cwt., with a weight of 16 tons upon a pair of driving wheels. One of the most useful engines is that designed by Mr. Aspinall, and called the standard radial tank engine, with a total weight of 59 tons 3 cwt., with 17.8 tons upon a pair of driving wheels. The photograph shows the type.

The average weight of the freight trains upon this road is 517 tons 10 cwt., with an average number of 45 wagons and a brake van on each train. As to the speed of passenger and freight trains very interesting diagrams are furnished by Mr. Aspinall, which show speeds in miles per hour drawn upon the profile of the line. An average speed of 29.2 miles per hour for a train 922 ft. long is certainly very good.

One of the excellent features of this railroad system is the very complete and modern locomotive works at Horwich, designed and built under the direction of Mr. Aspinall. This is well worth reproduction with this article in order that American locomotive engineers may have an idea of what is being done in England in later years in the arrangement, and extent as well, of locomotive works. The

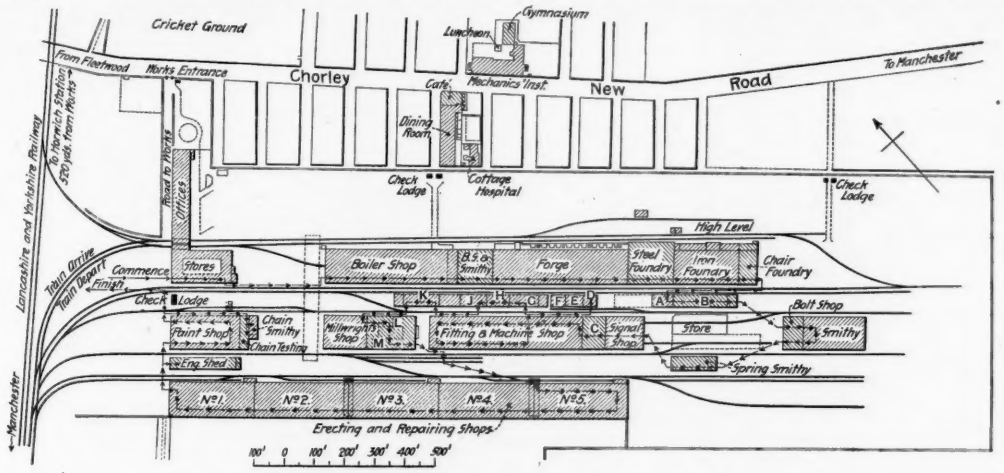


Lancashire & Yorkshire Standard Structure Gage.

Dimensions for straight line; to be modified on curves.

freight and passenger cars are not built at this point, the work relating almost entirely to locomotives, with, however, considerable work upon electrical interlocking and other matters of that kind. Nearly 4,000 men are employed at these works and over 3,000 at the car works, located elsewhere. An examination of these locomotive works shows the most complete and the most modern machinery and appliances of every kind. Nearly all of the work of

lifting and moving is done by electric cranes and electric travellers, and, as will be seen by examining the line of arrows, everything from the rough material to the finished work moves forward, going in at one point and coming out at nearly the same point. The entire arrangement in plan and in plant makes the least possible handling of material, consequently the work is done at the least possible expense. How important have been the results from



Horwich Locomotive Works—Lancashire & Yorkshire Ry.

this is seen from the fact that the total cost of repairs and complete renewals in 1897 with 1,377 locomotives is less by £3,600 than it was in 1876 with only 675 locomotives, the repairs in 1897 being £93,000 and in 1876, £99,607.

The intensity of the traffic is seen when we compare the number of locomotives per mile worked upon this road with those of others. Upon the Lancashire & Yorkshire in the year ending June 30, 1898, the number per mile worked was 2.18; no other road in Great Britain, except it may be some of the Metropolitan lines in London, approach anywhere near it. That of the Great Central is 1.41; the North Eastern, 1.20; The Midland, 1.50; the London & North Western, 1.16; Penn. RR., 0.7; N. Y., N. H. & H., 0.5; Erie, 0.45. These figures are extremely important as showing the immense business done over a comparatively small system.

The great density of the traffic will appear by comparing the gross receipts per mile with that of other important railroads. The annual gross receipts per mile for the year 1898 on several systems were approximately as follows:

Lancashire & Yorkshire	$45,000
London, Chatham & Dover	40,000
Midland	35,000
London & North Western	30,000
Great Eastern	20,000
Great Western	17,000
Pennsylvania	24,000
New York, New Haven & Hartford	20,000
New York Central & Hudson River	19,000
Erie	12,000

The large amount of traffic can also be seen by examining the following figures: The total tonnage on the Lancashire & Yorkshire during 12 months ending June, 1898, was as follows: Merchandise, 6,015,547; coal and coke, 11,404,516; minerals, 3,038,173. The following figures are of interest also: The cost of working per train-mile, passenger and freight, 78 cents; the average receipt per ton for merchandise, $1.45; coal, 29 cents; minerals, 64 cents; the average receipt per passenger, 13 cents. This shows that the traffic is conveyed over very short distances.

The total capital paid up and raised by loans on debenture stock is £62,748,365 ($305,584,542)—$550,000 per mile.

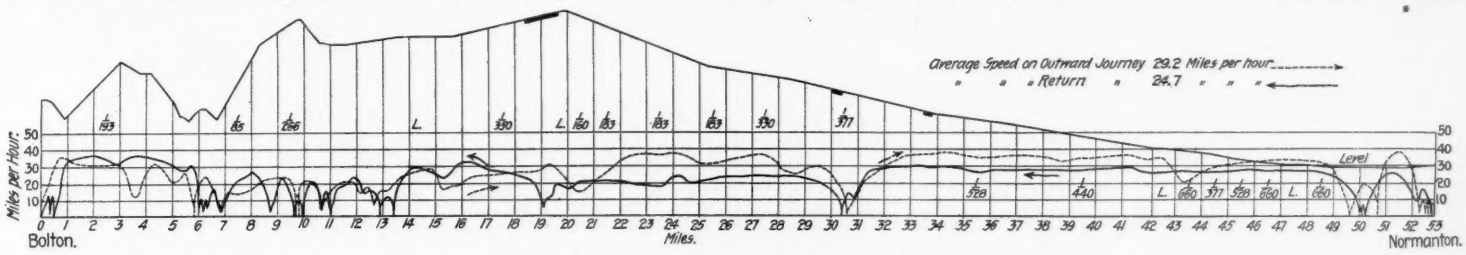
The traffic has steadily and quite regularly increased. In round numbers the business for the last decade has increased as follows: Number of passengers, from 44,750,000 in 1888 to about 60,000,000 in 1898, exclusive of season and periodical tickets; the total miles run, passenger and freight trains, from 14,850,000 in 1888 to 18,132,000 in 1898. While the road is largely a freight road, the passenger business, as will be seen from the above, is an important feature. In the Manchester station the total number of trains in and out per day is about 700.

This road was one of the first to adopt the plan of taking water from troughs in the tracks, even the tank engines being fitted with a pick-up apparatus, and they can take water whether running forward or backward. There is also a very complete block system on the entire road, of the most modern plant. There are 603 block signal houses with 1,670 signalmen. There are upon the entire line 260 stations.

This road was also the pioneer in many important improvements. It was the first in Great Britain to adopt a continuous brake; the first to provide smoking compartments; the first to light its trains with gas, and it took the lead also in signaling its main lines throughout with the block system, and it is stated that the section through Summit Tunnel, above referred to, was the first portion of any railroad ever worked on the block system by the electric telegraph. For many years every signal tower on the line has been placed on telephone circuits, there being seven or eight towers in each circuit. This not only permits the signalmen to communicate with each other, but also connects them directly with stations some distance away and enables the employees in the freight yards and passenger yards at large stations to advise signalmen in the towers upon the departure and arrival of trains.

The traffic is so crowded and intense on nearly the entire system that it has been necessary to adopt the very latest and most approved appliances for handling it. To any engineer or operating man about to visit Europe for the purpose of examining railroad systems, the writer would give the advice to certainly examine into the very excellent features of the Lancashire & Yorkshire Railroad.

Most of the information for this descriptive article was furnished to the writer by the following named officials of the road, to whom he is under great obligation for special facilities for making the examination and for courtesy in furnishing all data asked for: Mr. J. H. Stafford, the General Manager; Mr. W. B. Worthington, Chief Engineer; Mr. J. A. F. Aspinall, Chief Mechanical Engineer; Mr. Charles J. Nicholson, Passenger Superintendent, and Mr. W. J. Carmichael, Agent in charge of the Liverpool Terminal.



Profile and Speed Curves for Freight Trains.

Usual trains, engine, 45 loaded cars and brake van; total length of train, 922 ft.

The American Railway Association.

The fall meeting of this Association was held at the Waldorf-Astoria Hotel, New York City, Oct. 11. About 90 representatives were present. The number of roads in the Association is now 257 and the aggregate mileage is 171,180.

The Association voted to send eight delegates to the International Railway Congress to be held at Paris in September, 1900. The President and Secretary were chosen to fill two of these places and the other six will be filled by the President.

The principal committee report was that on the revision of the rules of order. New drafts of articles of organization and of by-laws were presented, and these were adopted by the Association, except that the 15th by-law was so changed as to elect officers and members of committees by pluralities instead of by majorities.

The articles of organization as reported by the committee consist of nine paragraphs embracing the substance of the more prominent features of the "rules of order" which have heretofore served as the constitution of the Association. A company, or two or more companies, working under one general operating official, is entitled to one membership, but if the mileage of road managed by this official exceeds one thousand miles there can be one additional membership for each additional thousand miles (nothing said about fractions). The vote of a "membership" shall be cast only by an official of the member voting.

The by-laws provide that the regular sessions shall be held on the fourth Wednesday of April and October, which is a little later than heretofore. The number of members required to make a quorum is changed from 20 to 30. The sixteenth by-law is as follows: "A vote in the sessions of the Association may be taken viva voce, by rising, by roll-call or by ballot, in any of which only members shall participate. A company having more than one membership must have an official present for each vote it may cast."

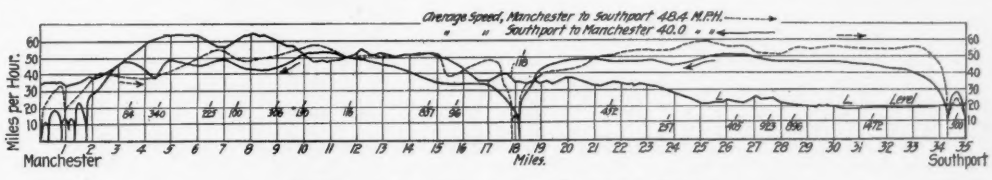
The clause allowing private car companies to become members is omitted from the new constitution, also that making ex-railroad officers eligible to honorary membership.

Most of the committee reports were brief and required little action; and there was not much discussion. The Committee on Car Service had answered a number of applications for construction of resolutions passed by the Association at former meetings. The committee holds that in paying for borrowed passenger cars by the day, fractions of days for a number of cars must not be added together and then reduced to whole days, but each car should stand by itself; thus, a car which is kept one day and 13 hours must be paid for as two days, and 10 cars for the same time 20 days. Inquiry was made as to the time limit for returning worn-out freight cars. An Eastern car may go to California and stay two years, and then, by the use of home cards, can be returned free. This occurs frequently with private owners' cars. The committee declines to take any action in this matter on behalf of the Association. It also declines to consider the question of per diem rates for freight cars used in local switching service; it is held that this would come within a general scheme of per diem rates, and on this the Association has heretofore refused to take action.

The committee is to gather information as to the best way of numbering freight cars so as to get along with a smaller number of numerals. A baggage car used for carrying freight must be paid for as a baggage car; not as a freight car.

The committee reports a code of car service rules without, however, recommending it; and as there was considerable difference of opinion as to the merits of a number of clauses the subject was recommitted. The code as reported contains 17 rules. These rules deal with the return home of foreign freight cars, in connection with which a penalty of one dollar a day for diversion is prescribed; the reporting of mileage on local and line cars (an elaborate system of reporting separate series of cars shall not be exacted); per diem rates for passenger cars hired; train mile rates for temporary running on foreign lines; demurrage rates (money must not be refunded except on the approval of the General Manager of the road); and the distribution of cars on the home road (as to who shall direct it).

The Committee on Safety Appliances reports that on July 1, 1899, the roads of the Association reported on air brakes and couplers as follows: Freight cars



Profile and Speed Curves for Passenger Trains.

Grades are expressed in ratios in the usual English way; approximate weight of engine and 10 coaches 200 long tons.

in service, 1,239,446; equipped with air brakes, 713,765 (57.5 per cent.); fitted with (M. C. B.) automatic couplers, 1,046,568 (84.4 per cent.); engines in service, 33,778; equipped with power brakes, 32,309 (92.2 per cent.).

The Joint Committee on Interlocking and Block Signals reports that considerable progress has been made in the revision of the definitions, the requisites of installation and the rules for the several block signal systems. The Committe on the Metric System expects to report at the next meeting on the extent of the adoption of that system in this country.

The Committee on Statistical Inquiry has done nothing, but hopes to do something before the next meeting.

The Committee on Standard Dimensions of Box Cars has tried by letter ballot to get an agreement on a standard size for box cars, the size proposed by the Committee being (inside measurement) 8 ft. high, 8 ft. 6 in. wide, 34 ft. long, cubical contents 2,312 cubic feet; but the number agreeing to this size was less than a majority, as follows: In favo of this standard, 96 members, owning 464,455 freight cars and working 63,337 miles of road; against the standard, 73 members, 540,222 cars, 74,991 miles. The committee will now try to find out the reasons for the objections to the typical car, and whether such reasons are likely to be permanent.

The Federal Industrial Commission.*

Before the Federal Industrial Commission at Washington, last week, Mr. Samuel Spencer, President of the Southern Railway, gave his views concerning government railroad regulation. He believed in the retention of the criminal clause of the Interstate Commerce Law; and that the best way to enforce the law requiring equal rates would be to rigidly carry out the criminal clause and to compel publicity of rates in every possible way. "It has been said," continued Mr. Spencer, "that men in the railroad business have to violate the law in order to hold their places, but I take the position that no man has the right to follow an illegal calling. If I can't comply with the law as a railroad man, the alternative of getting out of the business is left to me, and if I can't under such circumstances do what is right, I deserve no sympathy." He said that the Southern road had no secret rates, and, while some business had been lost in the beginning by pursuing an honest course, it had been regained. Mr. Spencer advocated the prohibition of ticket brokerage, and the total abolition of the present system of giving passes. He said he would even go to the extent of advocating the denial of passes to officers and employes of other roads. The speaker saw no danger of an increase in transportation rates as a result of the consolidation of railroads. Rates on the Southern are seven per cent. less than they were five years ago on the various roads now composing that system.

On Monday of this week the Commission heard President M. E. Ingalls, of the Chesapeake & Ohio. Mr. Ingalls declared his confidence in the Inter-State Commerce Commission as useful to the railroads. He said he was willing to trust the Commission to a large extent in the regulation of rates, and would be willing that its decisions should regulate unpassed upon by a United States Court. He wanted the Government to aid the railroads in the maintenance of rates; this power should go with the power to regulate the roads. There was less discrimination on the part of the roads now than during dull times, but he feared that with a diminution of business discrimination would again be common. Contracts between railroads should be legalized and suits authorized for the recovery of damages in case of a breach. There was more danger in giving free rein to the railroad pariahs and Ishmaelites than in legislation. He wanted the anti-pooling feature of the Inter-State commerce law abolished and advocated a law enabling the railroads to make rate agreements, their maintenance to be controlled by the courts.

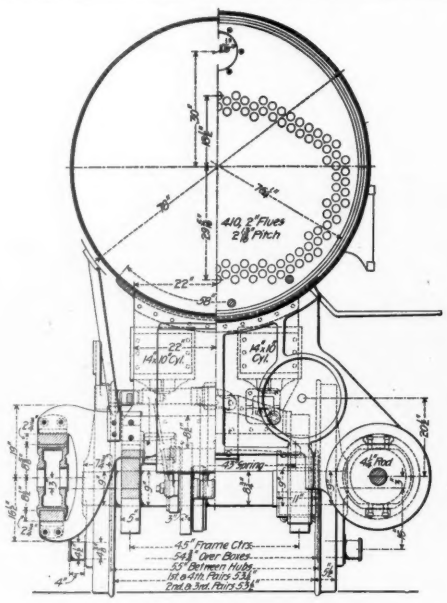
Mr. Ingalls also advocated the enforced publication of all freight rates, saying that he would be willing also to submit to the inspection of the books of the railroad companies, as the books of the National banks are now inspected. He thought the criminal feature of the law should be abolished. He also favored the abolition of free passes and ticket brokerage. With the proper laws for the regulation of rates so as to insure steady incomes to the roads, Mr. Ingalls said, he would favor of profit sharing.

A sub-committee of the Federal Industrial Commission is going to hold inquiries in Western cities concerning railroad discriminations. A meeting will be held in Chicago Nov. 15.

A Derrick Engine with "Simplex" Swinging Gear.

An improved hoisting engine has been brought out by the Lidgerwood Manufacturing Company, known as their "99" derrick engine with simplex swinging gear. It is of the standard Lidgerwood double drum type, with a patent attachment for swinging the boom of a derrick that is believed to be the simplest and most effective device ever designed for that purpose. The small friction drums which are used for the derrick swinging ropes are placed inside the winch heads and occupy little space, leaving the winch heads available for use the same as with an ordinary double drum engine.

Both these swinging drums are actuated by a vertical lever, arranged with a detent and quadrant, so that the lever may be applied and held by the detent in its position, without further attention on the part of the operator. The device is easily handled, and hoisting the load, raising the boom and swinging the boom can go on simultaneously. The winch heads are secured to the shaft by a sliding key or feather, and are of special form, having a sleeve upon which the swinging drum revolves. A powerful friction is used between the swinging drum and the winch head, so that the full power of the engine can be used. The friction contact is produced by cams placed between the swinging drums and the frame of the engine, while collars with anti-friction washers are placed on opposite sides of the frame to take up the thrust.



Sections of Twelve-Wheel Engine.

The operating cams are connected by links to the end of a lever, which is carried on a rock shaft extending across to the side where the operator stands, and where the vertical detent lever for operating the swinging device is placed. In the operation a rope is wound on the bull wheel of the derrick and is secured to it in the center. Each of the two ends is secured to one of the two swinging drums, enough rope being wound on each to give the required amount of motion to the bull wheel. By throwing the lever forward it engages the friction clutch on that winch, causing it to rotate and winding in the rope, which turns the boom in one direction, the other paying out the rope, as the cams are so constructed that the same movement which engages one friction disengages the other. By throwing the lever forward the friction of the rear friction drum is engaged, and the forward friction drum is released. Thus, the boom can be pulled in either direction.

The cams operating the frictions are so constructed that when the operating lever is in its central position there is enough frictional contact in the swinging drums to keep the ropes taut, and therefore, when one swinging drum is winding in the rope, the other drum has sufficient friction to prevent the rope which is paying out from overrunning. The means of adjustment is very simple, consisting of a nut on a stud bolt in the outer end of each winch shaft.

*For last week's report see page 720.

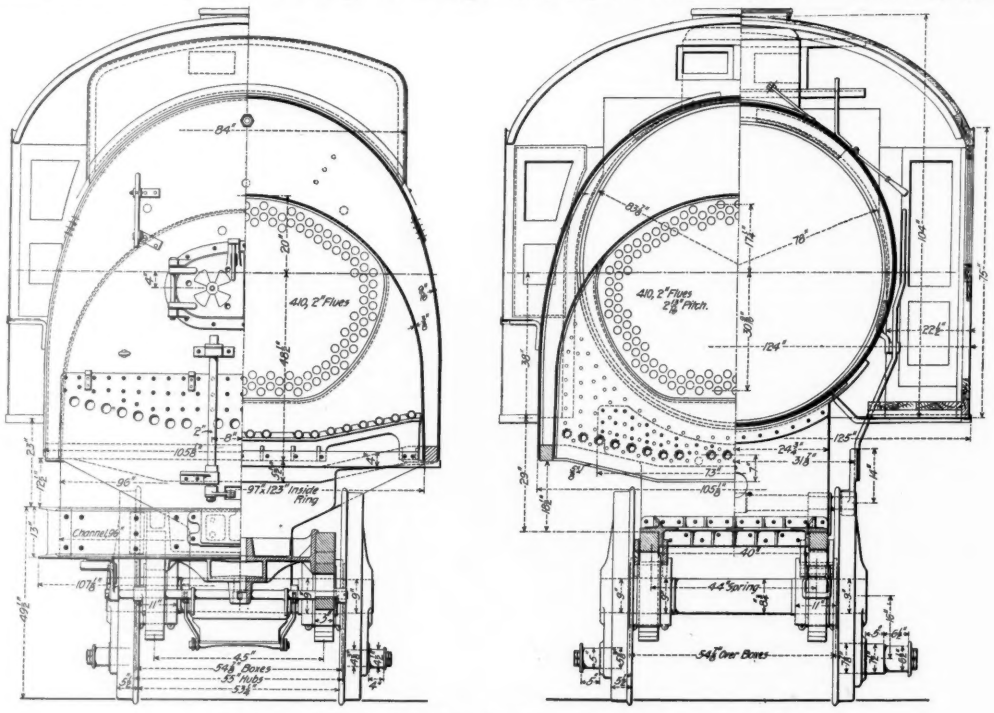
Brooks 12-Wheel Engines for the Lackawanna Railroad.

Fifteen locomotives, similar to the one shown in the accompanying engravings, have just been received for freight service on the Delaware, Lackawanna & Western Railroad from the Brooks Locomotive Works, Dunkirk, N. Y. The complete weight of these engines is 102½ tons and the tender weighs (loaded) 53 tons. The steam pressure is 200 lbs. The cylinder diameter is 21 in. and stroke 32 in. The tender is built for 5,000 gallons of water and for 10 tons of coal.

The new engines have a grate area of 82.4 sq. ft. This is 7 sq. ft. less than the grate area of the Decapod engines built by the Baldwin Locomotive Works for the Erie.

The boiler is of the "conical connection wagon top" type, and the diameter of the barrel, front, is 78 in. and at the throat, 89⅞ in. The total heating surface is 3,168 sq. ft.; the heating surface of the firebox, 218 sq. ft. The firebox is 123 in. long and 97 in. wide, with a depth at the front of 74 in. and at the back 64½ in. Water tube grates, as shown in the section view, are used. The following specifications give more complete details:

Gage	4 ft. 8½ in.
Kind of fuel	Fine anthracite
Weight on drivers	166,000 lbs.
" " trucks	39,000 lbs.
" total	205,000 lbs.
" tender, loaded	106,000 lbs.
General Dimensions.	
Wheel base, total, of engine	25 ft. 9 in.
" " driving	15 ft. 0 in.
" " total, engine and tender	50 ft. 4¼ in.
Length over all, engine	37 ft. 4⅛ in.
" " " total, engine and tender	60 ft. 2⅝ in.
Height, center of boiler above rails	9 ft. 2½ in.
" of stack above rails	15 ft. 1½ in.
Heating surface, firebox	218 sq. ft.
" " tubes	2,950 sq. ft.
" " total	3,168 sq. ft.
Grate area	82.4 sq. ft.
Wheels and Journals.	
Drivers, number	Eight
" diameter	54 in.
" material of centers	Cast steel
Truck wheels, diameter	30 in.
Journals, driving axle	9 in. x 11 in.
" truck	5½ in. x 12 in.
Main crank pin, size	6½ in x 6½ in.
" coupling pin, size	7½ in. x 5 in.
" pin, dia. wheel fit	7⅞ in.
Cylinders.	
Cylinders, diameter	21 in.
" stroke	32 in.
Piston rod, diameter	4¼ in.
Kind of piston rod packing	Jerome



Sections of Twelve-Wheel Engines for the Lackawanna Railroad.

Main rod, length center to center	98 in.
Steam ports, length	25 in.
" " width	2½ in.
Exhaust ports, least area	110 sq. in.
Bridge, width	3¼ in.
Valves.	
Valves, kind of	Improved piston
" greatest travel	6¼ in.
" steam lap (inside)	1 in.
" exhaust lap or clearance (outside)	Line and line
Lead in full gear	1/16 in. negative
" constant or variable	Variable
Boiler.	
Boiler, type of	Conical connection wagon top
" working steam pressure	200 lbs.
" material in barrel	Steel
" thickness of material in barrel	7/8 in. and 13/16 in.
" " " tube sheet	¾ in.
" dia. of barrel, front	78 in.
" " " " at throat	89⅞ in.
Seams, kind of horizontal	Sextuple lap
" " " circumferential	Triple lap

Crown sheet, stayed with	Radial stays
Dome, diameter	30 in.

Firebox.

Firebox, type	Wide, over wheels
" length	123 in.
" width	97 in.
" depth, front	74 in.
" " back	64½ in.
" material	Steel
" thickness of sheets	Crown, ⅜ in.; tube, ⅝ in.; side and back, ⅜ in.
" brick arch	None
" mud ring, width	Back and sides, 3½ in.; front, 4 in.
" water space at top	Back, 4½ in.; front, 4 in.
Grates, kind of	Water tube
Tubes, number of	410
Tubes, material	Charcoal iron
" outside diameter	2 in.
" thickness	No. 12 B. W. G.
" length over tube sheets	13 ft. 10¼ in.

Smokebox.

Smokebox, diameter, outside	81 in.
" length from flue sheet	67½ in.

Other Parts.

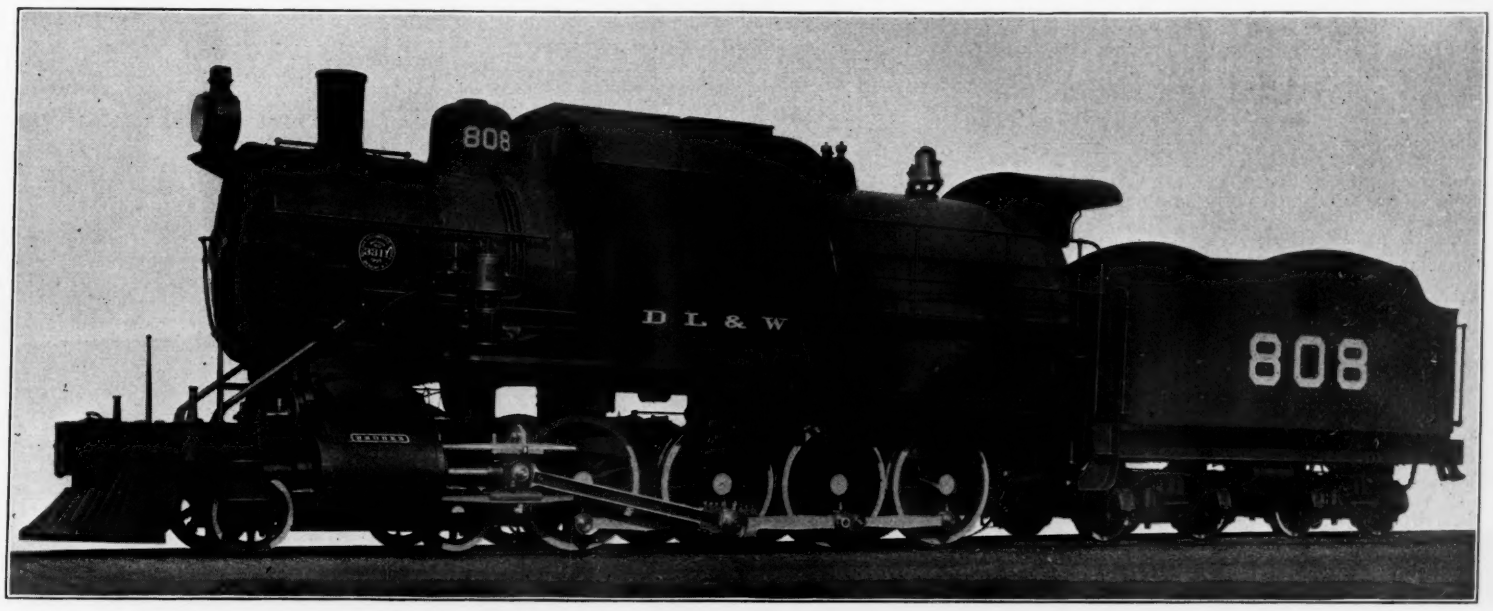
Exhaust nozzle, single or double	Single
" " variable or permanent	Permanent
" " diameter	5½ in.
" " distance of tip below center of boiler	5 in.
Netting, wire or plate	Wire
" size of mesh or perforation	2½ x 2½ and 2½ x 1¼
Stack, straight or taper	Steel, taper
" least diameter	15¼ in.
" greatest diameter	17¾ in.
" height above smokebox	30½ in.

Tender.

Type	8-wheeled
Tank, type	B. L. W. sloping top
" capacity for water	5,000 gal.
" " " coal	10 tons
" material	Steel
Tank, thickness of sheets	¼ in.
Type of under frame	Steel channel
" " springs	Double elliptic
Diameter of wheels	33 in.
" and length of journals	5 in. x 9 in.
Distance between centers of journals	5 ft. 5 in.
Diameter of wheel fit on axle	6⅝ in.
" of center of axle	5⅝ in.
Length of tender over bumper beams	21 ft. 8½ in.
" " tank	19 ft. 6 in.
Width " "	10 ft. 0 in.
Height " " not including collar	60 in.
Type of draw gear	M. C. B. Gould

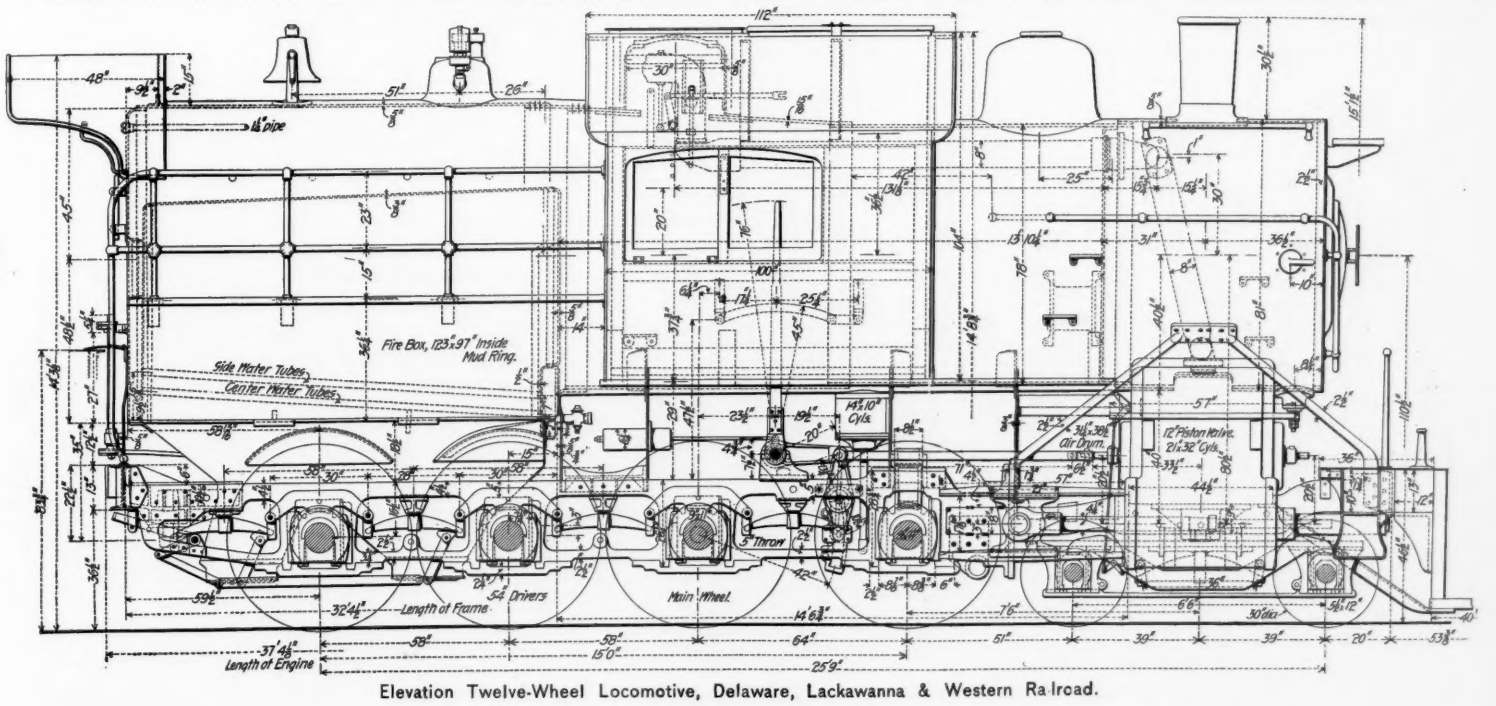
Special Equipment.

Brakes	American for drivers; Westinghouse for tender and train service
Pump	9½ in.
Sight feed lubricators	Detroit
Safety valves	Kunkle
Injectors	Metropolitan
Springs	National
Metallic packing, piston rods	Jerome
" " valve "	B. L. W. Special
Spark arrester	Improved Bell



Twelve-Wheel, 205,000 Lbs. Locomotive, Delaware, Lackawanna & Western Railroad.

MR. JOHN W. FITZGIBON, *Superintendent Motive Power and Machinery.* *Built by the* BROOKS LOCOMOTIVE WORKS, *Dunkirk, N. Y.*



Elevation Twelve-Wheel Locomotive, Delaware, Lackawanna & Western Railroad.

Train Accidents in the United States in August.

COLLISIONS.

Rear.

1st, on Southern Pacific, near Oakland, Cal., a passenger train ran into the rear of a preceding train of water tank cars, damaging the engine and one car; the conductor and brakeman were injured.

2d, on Southern Railway, near Cleveland, Tenn., a work train ran into the rear of a preceding freight train and the engine and seven cars were badly damaged. The engineman was injured. It is said that a flagman who had been sent out by the freight sat down on the ground and went to sleep.

6th, on Pennsylvania road, near Downington, Pa., a freight train broke in two and the rear portion afterward ran into the forward one; two brakemen injured.

10th, on Chesapeake & Ohio, at Staunton, Va., an eastbound passenger train ran over a misplaced switch and into some freight cars standing on a side track. One of the two engines drawing the passenger train fell down a bank, and the freight cars standing on the side track were badly damaged. Four trainmen and four men at work in the freight cars were injured.

11th, on Pennsylvania road, near Johnstown, Pa., a freight train ran into the rear of a preceding freight, and a brakeman riding deadhead and sleeping in the caboose was killed. The engine was overturned and 20 cars were badly damaged. It is said that the flagman of the foremost train had been back and was just returning to his own train.

11th, on New York Central & Hudson River, at Rochester, N. Y., a passenger train which had been unexpectedly stopped, just after leaving the station, by the automatic application of the air brakes, was run into by two empty engines closely following, badly damaging one engine and one sleeping car. One passenger was injured.

13th, on Baltimore & Ohio, at Van Bibber, Md., a freight train ran over a misplaced switch and into the rear of another freight standing on a side track; the engineman was injured.

14th, on Cleveland, Lorain & Wheeling, near Canal Dover, O., a passenger train ran over a misplaced switch and into some freight cars standing on a side track. Three passengers and two trainmen were injured.

17th, on Atlanta & West Point, near Hogansville, Ga., a freight train descending a grade broke in two and the rear portion afterward ran into the forward one, wrecking 10 cars; two trainmen injured.

23d, on New York Central & Hudson River, at Palatine Bridge, N. Y., a freight train broke in two and the rear portion afterward ran into the forward one, wrecking one car. One trainman was injured.

23d, on Pennsylvania road, at Ivy Rock, Pa., a freight train ran into the rear of a preceding freight, wrecking the engine and five cars. One trainman was injured. A passenger train on an adjoining track ran into the wreck and was slightly damaged. The passenger fireman was injured.

26th, 1 a. m., on Central of New Jersey, at High Bridge, N. J., a train of empty coal cars apart, on a descending grade, in two places; and the parts collided on a bridge, at the same time that a loaded coal train was passing in the opposite direction. Thirty-seven cars were wrecked and one car of coal was knocked off the bridge.

26th, on St. Louis Southwestern, near Wylie, Tex., a freight train approaching a water tank broke in two and the rear portion afterward ran into the forward one. A brakeman standing on the tender was killed.

26th, 11 p. m., on Baltimore & Ohio, near Dunbar, Pa., a freight train descending a grade broke in two and the rear portion afterward ran into the forward one, damaging 13 cars. Three trainmen and a tramp were injured.

27th, 2 a. m., on Central of New Jersey, near Whitehouse, N. J., an eastbound freight train which was taking water was run into at the rear by a following freight which had become uncontrollable on a descending grade, and the engine and wrecking cars were wrecked. Two trainmen were injured.

27th, on Philadelphia & Reading, at Valley Forge, Pa., a freight train ran into the rear of a preceding freight and the engine and six cars fell down a bank. A man sleeping in the caboose was injured.

28th, on Northern Pacific, at Ellensburg, Wash., an eastbound passenger train ran into the rear of a preceding freight train, standing on the main line. The engine was ditched and the mail car was wrecked. The engineman was injured. It is said that the freight conductor failed to promptly signal the passenger train.

29th, on Chicago, Rock Island & Pacific, at Keats,

Kan., passenger train No. 10 ran into the rear of a preceding freight; two passengers and six trainmen were injured.

30th, on Norfolk & Western, at Salem, Va., a freight train standing at the station, was run into at the rear by a following freight. A block signal man gave an all-clear signal to the second train when the first had not vacated the block section.

31st, on Chicago & Eastern Illinois, near Terre Haute, Ind., a freight train collided with some freight cars which had been left standing on the main track, and the engineman, one brakeman and an air brake inspector riding on the engine were killed.

And 22 others, on 18 roads, involving 39 freight trains.

Butting.

2d, on Wabash road, at La Otto, butting collision of freight trains, each drawn by two engines and both running at good speed. One fireman was killed and one engineman fatally injured.

8th, on Colorado Midland, near Woodland Park, Colo., butting collision between passenger train No. 11 and an empty engine; four trainmen injured.

8th, on Knoxville & Ohio, near Offutt, Tenn., butting collision of freight trains, making a bad wreck. One engineman and one fireman were killed and the other two were injured. It is said that the train going toward Knoxville was running in disregard of a meeting order.

18th, on Newburg, Dutchess & Connecticut, at Matteawan, N. Y., butting collision of passenger trains, badly damaging both engines. One trainman was injured. It is said that there was a mistake in meeting orders.

22d, on New York Central & Hudson River, at Ida Street, Troy, N. Y., butting collision between a switching freight train of the Delaware & Hudson and a freight engine of the New York Central. A brakeman was killed.

26th, on Union Pacific, at Muncie, Kan., butting collision of two passenger trains of the Chicago, Rock Island & Pacific, badly damaging both engines and one baggage car. Two passengers were injured. It is said that the eastbound train was running on the time of the westbound without right.

28th, 4 a. m., on Baltimore & Ohio, at Barracksville, W. Va., butting collision of freight trains, making a bad wreck. Two trainmen were killed and three others fatally injured.

31st, 11 p. m., on Illinois Central, near Martinsville, Miss., butting collision of freight trains, wrecking both engines and 18 loaded cars. It is said that the southbound train ran past a station where it should have waited for the northbound, mistaking for the latter an extra train which was standing on the side track.

And 9 others on 9 roads, involving 4 passenger and 14 freight and other trains.

Crossing and Miscellaneous.

3d, on New York Central & Hudson River, at Utica, N. Y., a switching freight train ran over a misplaced switch and collided with some empty freight cars; one trainman injured.

4th, at 11 p. m., on Central of New Jersey, at Mauch Chunk, Pa., an eastbound freight train ran into an empty engine which was backing from the engine house to the main track, and both engines were wrecked. One engineman was killed and another trainman injured.

5th, at 3 a. m., on Southern Railway, at Manassas, Va., a freight train entering a side track was run into by a freight from the opposite direction, and one engine and several cars fell down a bank. The engineman and fireman were killed.

5th, on Pittsburgh, Youngstown & Ashtabula, near Lowell, Pa., collision between a passenger train and an empty engine, badly damaging both engines; two trainmen injured.

7th, on the Long Island road, at Jamaica, N. Y., an eastbound passenger train ran through a crossover track and into the side of a westbound passenger train, damaging one car. The conductor and two passengers were injured.

7th, on New York Central & Hudson River, at Hudson St., Buffalo, N. Y., collision between a freight train and a switching train of the Grand Trunk. The Grand Trunk fireman was fatally injured.

7th, on Pennsylvania road, near Harrisburg, Pa., collision of freight trains; three trainmen injured.

10th, at Brinkley, Ark., a passenger train of the Choctaw & Memphis, was run into by a freight of the St. Louis Southwestern at the crossing of the two roads. The latter train was moving backward. One trainman and six passengers were injured, one of them fatally.

11th, 2 a. m., on Philadelphia, Wilmington & Baltimore, near Bowie, Md., a freight train ran over a misplaced switch and into some cars standing on a side track, damaging several cars. Two trainmen were injured.

12th, on Chicago, Peoria & St. Louis, at Athens, Ill., a freight train collided with a car standing on a side track, but fouling the main line, and the engine was overturned. The engineman jumped off and was injured.

15th, on Chicago, Burlington & Quincy, at Des Moines, Ia., collision between a freight train and a switching engine, badly damaging both engines and several cars. One fireman was badly injured. It is said that the collision was due to a misplaced switch.

16th, on Delaware & Hudson, at Willsboro, N. Y., collision of locomotives, injuring one engineman.

17th, on Boston & Maine, at Grand Beach, Me., freight train No. 602 broke in two; and the forward portion, when being set back to be coupled to the rear portion, ran into the latter so violently as to wreck two cars. The collision was due to the failure of a brakeman's lantern, so that he was unable to give a stop signal in season. A brakeman was injured.

20th, on Cincinnati & Muskingum Valley, at Circleville, O., a passenger train ran over a misplaced switch and into a locomotive standing on the side track, wrecking both engines and damaging the baggage car. Three passengers and two trainmen were injured.

28th, on Southern Pacific, at Santa Clara, Cal., collision of passenger trains, one of which was drawn by two engines. Two of the engines were overturned and the mail car was ditched. Two trainmen were injured.

29th, on Union Pacific, near Kansas City, Mo., a passenger train of the Rock Island road collided with a switching train of the Union Pacific, badly damaging both engines. One engineman was injured.

30th, on Erie road, near Montclair, N. J., two platform cars, loaded with stone, broke away from a freight train and ran back down grade about 5 miles to a point near Arlington, where they collided with a passenger train moving in the opposite direction. One passenger was killed and 15 passengers and five trainmen were injured, two of the passengers and one of the trainmen being fatally hurt. A trainman rode on the runaway cars the whole distance, but, in consequence of the failure of a brake chain, was unable to control them.

And 12 others on 11 roads, involving 8 passenger and 16 freight and other trains.

DERAILMENTS.

Defects of Roadway.

11th, on Pittsburgh & Western, at Youngstown, O., a freight train was derailed by a broken rail and two trainmen were injured.

And 4 others on 4 roads, involving 1 passenger train and 3 freight and other trains.

Defects of Equipment.

2d, on Pittsburgh, Cincinnati, Chicago & St. Louis, at Kokomo, Ind., a freight train running at good speed broke in two and, the rear portion being quickly stopped by the automatic application of the air brakes, five cars were wrecked; a brakeman was killed.

4th, on Columbus, Sandusky & Hocking, near Delaware, O., a freight train was derailed by a broken axle and 12 cars were ditched; a brakeman was injured.

8th, on Southern Pacific, near Los Palos, Cal., a southbound passenger train was derailed and the engine and nine cars were ditched. The engineman and fireman were fatally scalded and five passengers were injured. It is said that the derailment was due to a broken wheel.

8th, on New York Central & Hudson River, at Blackwells, Pa., a northbound freight train broke in two near the front end, and the sudden stoppage of the train by the automatic application of the air brakes derailed a number of cars. The train was being helped by a following train which had three engines, one at either end and one in the middle; and the caboose of the foremost train was knocked out and fell down a bank. Twelve freight cars were damaged, but the only personal injury was to a brakeman who got caught in a barb wire fence.

13th, on St. Louis, Iron Mountain & Southern, at Bierne, Ark., a freight train was derailed by a broken wheel and 17 cars were wrecked; two brakemen were injured. Most of the cars contained beer and the free drinking which followed the wreck resulted in a fight, which developed into a contest between white men and negroes, participated in by over 100 persons. Twelve men were badly clubbed, and a sheriff with 35 deputies was called to the scene to restore order. Fortunately, all of the gentlemen involved had left their side arms at home; hence there was no shooting and no fatal injury to any one.

14th, on Pennsylvania road, at Fowler, Pa., a freight train was derailed by a broken axle, and nine loaded cars were wrecked. One trainman was injured.

19th, 4 a. m., on Philadelphia & Reading, near Souderton, Pa., a freight train was derailed by a broken axle and 16 cars were wrecked. A brakeman was fatally injured.

22d, on New York Central & Hudson River, at Syracuse, N. Y., a freight train was derailed by a broken axle and several cars and a pushing engine were wrecked. One engineman, one fireman and a section master were badly injured.

29th, on Chicago, Rock Island & Pacific, near Eldon, Ia., a passenger train was derailed by a broken wheel and the engine and first three cars were badly damaged. Four trainmen were injured.

And 16 others on 11 roads, involving 1 passenger train and 15 freight and other trains.

Negligence in Operating.

11th, on Nashville, Chattanooga & St. Louis, at Chattanooga, Tenn., a switching engine which became uncontrollable on a steep grade leading to the Tennessee River ran down the hill and sank in the mud of the river. Several freight cars were ditched.

18th, on Chicago, St. Paul, Minneapolis & Omaha, near Rice Lake, Wis., the engine and 18 cars of a work train were derailed at a point where the track was being repaired, and two employees were injured. It is said that a flagman who should have warned the work train failed to do so.

23rd, on Maine Central, near Brunswick, Me., a work train was derailed at a point where the track was being repaired, and the engine was overturned. It is said that the repairmen failed to put out a signal.

26th, on Erie road, at Buffalo, N. Y., a switching freight train was derailed at a misplaced switch and a brakeman was injured. It is said that the switch was misplaced by mischievous boys.

30th, on Chicago & Northwestern, at Richmond, Ill., a passenger train was derailed by a misplaced switch and the engine was overturned. The engineman was injured.

And 11 others on 10 roads, involving 4 passenger and 8 freight and other trains.

Unforeseen Obstructions.

3rd, on Rio Grande Western, near Solitude, Utah, a freight train was derailed by a washout and the engine and several cars were wrecked. The engineman and fireman were killed.

5th, on Cincinnati, Hamilton & Dayton, near Middletown, O., a freight train running at good speed was derailed at a washout and the engine and several cars were ditched. A man riding on the locomotive was injured.

18th, on Kinderhook & Hudson, at Sunnyside, N. Y., a work train was derailed by running over a cow, and the engine was overturned. The conductor, engineman and several laborers were injured.

29th, on Kansas City, St. Joseph & Council Bluffs, at Barnard, Mo., a freight train was derailed by running over some cattle, on a bridge, and the engine and nine cars were ditched. The engineman was killed and the fireman fatally injured.

And 9 others on 8 roads, involving 2 passengers and 7 freight and other trains.

Unexplained.

3rd, on White & Black River Valley road, at Simmon's, Ark., a freight train was derailed and three cars were wrecked; a brakeman was killed and a passenger in the caboose was injured.

4th, on Nashville, Chattanooga & St. Louis, at Nashville, Tenn., a freight train was derailed and a car ran against the support of an overhead bridge. The bridge being weakened, an electric street car which was on it at the time, fell to the ground below, and the conductor, six passengers and motorman were injured, the latter fatally.

6th, on Pittsburg, Youngstown & Ashtabula, at Youngstown, O., a freight train was derailed and 20 cars were badly damaged; four trainmen were injured.

8th, on Pennsylvania road at Altoona, Pa., a car of a freight train jumped out of line at a switch and ran against a freight train moving on an adjoining track, and a man riding on a platform car was killed.

11th, on Brooklyn Elevated road, near the Bridge, Brooklyn, N. Y., a train was derailed at a switch and one car came near falling off.

12th, on Philadelphia & Reading, near Lansdale, Pa., passenger train No. 120 was derailed and fell down a bank; three trainmen and three passengers were injured. The engine was running tender first and the tender was the first vehicle to jump the track. The track was found to be in perfect condition.

14th, on Philadelphia & Reading, at Beach Street, Philadelphia, a switching engine was derailed and fell against a building adjoining the track; the fireman was killed.

15th, on Cleveland, Cincinnati, Chicago & St. Louis, near Tower Hill, Ill., a freight train was derailed and six cars were wrecked. Two tramps were injured.

18th, on Manhattan Elevated road, Second Avenue Line, at Allen Street, New York, a passenger train was derailed at a curve and one passenger car came near falling into the street.

19th, on Kansas City, Pittsburgh & Gulf, near Horatio, Ark., a passenger train was derailed and the engine and baggage car fell into the Little River.

18th, on Transylvania road, near Brevard, N. C., a passenger train was derailed and two cars fell down a bank. Two trainmen and three passengers were injured.

30th, on Missouri, Kansas & Texas, near, Erie, Kan., a stock train was derailed and seven cars of cattle fell down a bank. Two tramps were killed.

And 28 others on 26 roads, involving 2 passenger and 26 freight and other trains.

OTHER ACCIDENTS.

8th, 1 a. m., on Cincinnati, New Orleans & Texas Pacific, seven miles south of Somerset, Ky., in tunnel No. 4, a southbound freight train of 28 cars was wrecked by an explosion of a car of naphtha in the train when near the middle of the tunnel. There was a car of oil next to the naphtha and a furious fire resulted, blocking the road for several days. One man, apparently a tramp, was burned to death.

21st, on Missouri, Kansas & Texas, near Green Ridge, Mo., a car of cattle in a freight train caught fire, presumably from a hot box, and was destroyed. All the animals but one were saved.

And 2 others on 2 roads, involving 2 passenger trains.

The K. C., P. & G. Freight-Rate Injunction.

The principal features of the contest between the Kansas City, Pittsburgh & Gulf and its competitors, concerning the very low rates established by that road from New York, by way of Galveston, to Kansas City, have already been reported in the Railroad Gazette. The gist of Judge Thayer's decision directing the Receivers of the road to withdraw the very low rates which they had made was given in our issue of Oct. 6, page 702. In the suit of the "P. G." to compel its connections to pro-rate with it, one of the principal defendants was the Atchison, Topeka & Santa Fe. This road was interested in the matter on two sides. It is a carrier from the Gulf to Kansas City; and, while willing to make a reduction for the sake of getting freight from New York, if such freight could not be turned into the Atchison hopper in any other way, it was not willing to make such a severe reduction as the "P. G." made. Secondly, the Atchison is interested as a carrier from Chicago to Kansas City of freight, from the same competitive starting point, brought to its eastern terminus by the old all-rail lines.

The argument presented by the Atchison at the hearing on the injunction, in justification of its refusal to countenance extremely low rates from the Gulf, was made up of some interesting facts tending to show that the "P. G." had been carrying freight for less than cost. The Receivers deny this allegation, claiming, of course, that while the rates were very low, as must have been necessary if the road was to get any through freight at all, the business was not carried at a loss. The percentages and comparisons presented by the Atchison are, however, of interest as throwing light on the difficult task which confronts the management of a new road in a thinly settled country which must make its living out of the profits on traffic which can be got only by taking it away from older railroads. We give below the facts presented by the Atchison, without, however, discussing the conclusions and implied conclusions reached from them, some of which ought to be more fully explained.

The accompanying outline map shows the relative situations of New York, Chicago, St. Louis, Kansas City, Omaha, Sioux City and Denver. It also shows in broken lines the Gulf Route to Kansas City formed by the Mallory Line, New York to Galveston, and the Kansas City, Pittsburgh & Gulf road, in connection with the Gulf & Interstate road (its Galveston connection), and the routes of the combined water and rail lines via Newport News and via Savannah. Tables of relative rates and distances by these routes are given with the map.

The Interstate Commerce Commission's geographical groups are shown on the map, and Groups VIII. and IX. are separated from those around them by a heavy line. The Kansas City, Pittsburgh & Gulf road is wholly situated in these, and they include a

large proportion of all the mileage represented by the defendants in the case in question. The total mileage embraced amounts to 33,761 miles of railroad, or about one-sixth of the entire mileage of the United States.

The double line, commencing about the center of the map at Jefferson City, Missouri, and running north and west through Iowa, South Dakota and Montana, indicates in a general way the meeting points of the rates from New York by the direct lines and by the Gulf Route. Its most important significance, however, is in showing in a graphic way the vast amount of territory throughout which the regular rates of transportation are reduced by the action of the Gulf Route. The entire country west and south of this line and east of the Sierra Nevada Mountains is thus affected. It should also be remembered that the business affected at the east end of the route is not confined to New York; the same rates apply to a large territory adjacent thereto, reaching as far east as Boston and for a considerable distance into the interior of New York and Pennsylvania, the transportation charges to New York being absorbed by the Gulf Route.

The accompanying diagram presents in graphic form the results of operation of all the railroads in Groups VIII. and IX. above referred to, for the year ending June 30, 1898, and, compared with the same, the results on the Kansas City, Pittsburgh & Gulf. The averages of all the roads in Groups VIII. and IX. are each considered equivalent to 100 per cent., and the relation of those of the Kansas City, Pittsburgh & Gulf road to these is shown by the lines not ending at the 100 mark.

The stock and bonds of all the railroads in Groups VIII. and IX. returned as profits to their owners, in the year ending June 30, 1898, the sums and percentages shown in the following table:

Total miles of road	33,761
Total funded debt	$858,252,202
Normal rate of interest was paid on (64.08 p. c.)	549,950,713
1 to 4 per cent. paid on (19.28 per cent.)	165,474,755
Nothing paid on (16.64 per cent.)	142,826,734
Total capital stock	896,235,340
Normal rate of dividend paid on (2.38 per cent.)	21,169,383
1 to 4 per cent. paid on (9.88 per cent.)	89,148,611
Nothing paid on (87.74 per cent.)	785,917,346

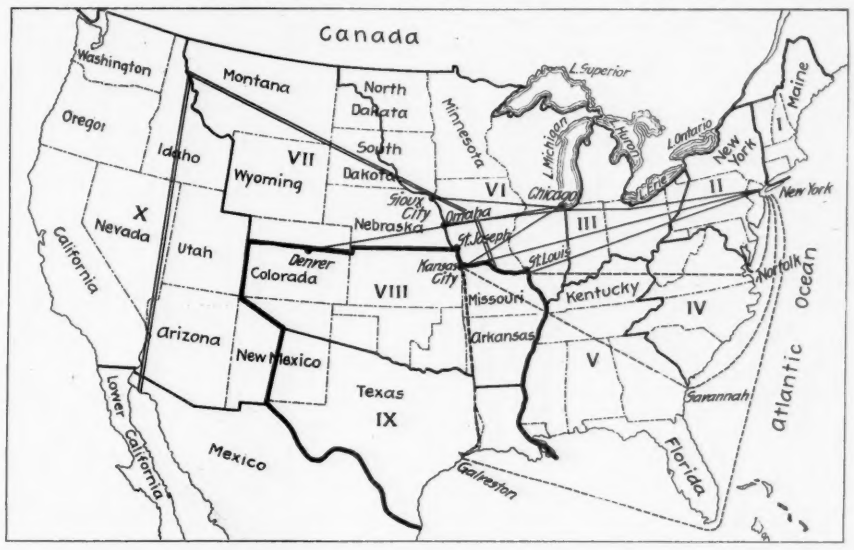
In the diagram the first two items exhibit the relative funded debt and interest charges per mile of line of all the roads in the two groups, as compared with the Kansas City, Pittsburgh & Gulf. The P. G.'s revenue per passenger per mile, as shown by the third item, is somewhat in excess of the average of the groups, but its revenue per passenger train mile, as shown by the fourth line, is materially less. This is owing to the relative density of passenger traffic, as illustrated by the fifth item, showing passenger miles per mile of road.

A reference to the sixth item, which shows the revenue per ton-mile earned by the P. G. and the Group lines respectively, in connection with the seventh, eighth and ninth, representing the revenue per freight train mile, the distance each ton was carried and the ton-miles per mile of road, will throw light on the following analysis of the operations and balance sheet of the Kansas City, Pittsburgh & Gulf for the year ending June 30, 1898:

	Amount.	Per mile.
First mortgage bonds	$22,578,000	$27,987
Equipment bonds	1,983,762	2,488
Total bonds	$24,561,762	$30,475
Stock	$23,000,000	$28,538
Total capitalization	$47,561,762	$59,013
Annual Charges:		
Interest on mortgage bonds	$1,128,900	
Interest on equipments bonds	119,026	
Taxes, 1898	54,143	
	$1,302,069	$1,615
Results of operation for year ending June 30, 1898:		
Gross earnings	$2,878,159	
Operating expenses	2,139,182	
Net earnings	738,977	
Other income	1,452	
Total income	740,429	
Annual charges as above	$1,302,069	
Increase in current liabilities over Previous year	203,313	1,505,382
Net loss from operation		$764,953
Detail of net loss for year:		
Difference in surplus June 30, 1897 and 1898	153,326	
Increase of current liabilities	203,313	
One year's interest on equipment bonds	119,026	
Difference between amount of total year's interest accrued and amount actually paid	289,288	
	$ 764,953	
Expended for maintenance of way per mile	$479	
Expended for maintenance of equipment per mile	332	

If the average amount paid for maintenance by the roads in the Groups to which the Kansas City, Pittsburgh & Gulf belongs had been expended for that purpose by that road, viz., $744 per mile for maintenance of way, and $482 per mile for maintenance of equipment, the total net loss for the year would have been $1,099,443.

It will be seen that although the ton-miles per mile of road were largely in excess of the average of the Groups, the revenue per freight train mile and the freight earnings per mile of road were both under the average, indicating either very low rates or a very large proportion of low class freight; probably both. It will be noted that the ton-miles per mile of road, which is the measure of the density of the traffic, is much greater than the average. The high average length of haul shows that this excess was through traffic, while the difference in the rate per ton-mile received by the Kansas City, Pittsburgh & Gulf as compared with the average of the Groups, supports the statement that the business was done at an extremely low rate. This last proposition is further verified by the following table,



Routes and Distances from New York to Kansas City.

Comparison of Distances (Short-Line Mileage) from New York to

	Direct Line.	Gulf Route.
Kansas City	1,318	3,136
Omaha	1,403	3,330
Sioux City	1,422	3,451
Denver	1,941	3,775
Cheyenne	1,919	3,846
Deadwood	2,034	3,964

Comparative Rates and Distances to Kansas City.

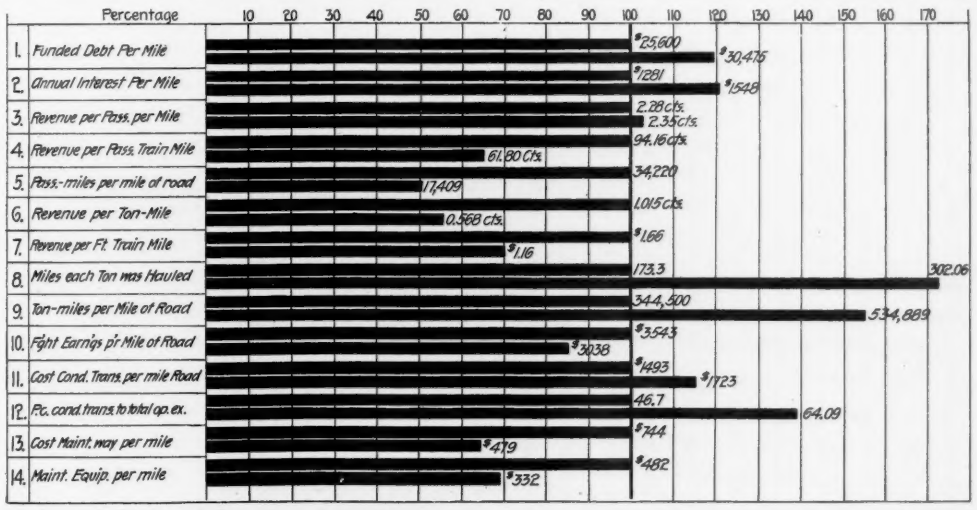
From	Miles.	Cents per 100 lbs. Class 1.	Class 2.	Class 3.	Class 4.	Class 5
St Louis, all rail	277	60	45	35	27	22
Chicago, all rail	458	80	65	45	32	27
New York, all rail	1,318	147	120	93	68	57
New York, Str to Norfolk	1,570	137	112	87	64	53
New York, Str. to Savannah	1,963					
New York, Str. to Galveston.	3,136					
Same, reduced tariff		80	65	52	44	34
K. C. P. & G. proportion of 80-ct. tariff	766	34.2	27.7	22.2	18.8	14 4

which gives the published tariff rates by the various lines in these Groups, including the Kansas City, Pittsburgh & Gulf, for the corresponding distances out of Kansas City. (The eighty-cent scale is chosen in order that it may be compared against the mileage of the corresponding scale from New York to Kansas City by the Gulf Route).

Kansas City to—	Road.	Miles.	1	2	3	4	5
Petros Mill	K. C. P. & G.	349	80	70	60	45	35
Hazleton	A. T. & S. F.	331	80	67	59	51	44
Thayer	K. C. Ft. S. & M.	340	80	65	50	40	30
Tiowah	M. Pac.	358	80	70	63	45	36
Furley	C. R. I. & P.	360	81	72	62	50	42
Grinell	Union Pacific	365	80	73	67	57	50

While the normal rates of the Kansas City, Pittsburgh & Gulf road on non-competitive freight are practically the same as those of the other roads in the same region, it did a sufficiently large business at very low rates to reduce its average rate to but little more than one-half that of the other roads. The revenue received by the P. G. on freight billed at the eighty-cent scale from New York to Kansas City on fifth class freight was but little more than three mills per ton-mile.

It is understood to be claimed by the Kansas City, Pittsburgh & Gulf road that it is able to operate its line cheaper than those of other roads in the same territory. The eleventh item of the diagram does not bear out this claim. All items of operating expenses are divided under four heads, namely, Maintenance of Way, Maintenance of Equipment, Conducting Transportation, and General Expenses. As already stated, the first two of these items may be reduced temporarily, but the third item, that of "Conducting Transportation," cannot be thus varied. Items nine and ten show conclusively that not only does it cost the P. G. more per mile to operate its road (which may be properly assignable to its larger tonnage hauled), but the percentage of the cost of conducting transportation to its total operating expenses is much greater. The diminution of maintenance below the average will appear from the last two items of the diagram.



Comparison of Results of Operation of the Kansas City, Pittsburg & Gulf Railway, with the Average of All Railroads Embraced in Groups VIII. and IX (33,761 Miles) for the Year Ending June 30, 1898.

NOTE.—The average of the group mileage is represented by the upper heavy line of each item (1, 2, 3, etc.) and is shown as 100 per cent. The K. C., P. & G. operations are represented by the lower line of each item and the relation of these to the 100 per cent. lines indicates the percentages. Thus, in item 7, the average revenue per freight train mile on the K. C., P. & G., $1.16, was 70 per cent. of the average ($1.66) on the roads of the double group as a whole.

Embellishment of Station Grounds on the Michigan Central.*

In the embellishment and maintenance of station grounds several things may be considered; the cost of embellishment and maintenance, how to accomplish these things, and the results derived.

Probably all who have made a daylight trip over the Michigan Central have been impressed with the handsome appearance of the station grounds, especially those at Niles, where for many years flowers have been given to ladies on the through trains. At Niles are located the greenhouses for the Western division, this being the headquarters of the maintenance department of the various station grounds scattered along some 170 miles of the main line west of that place. About ten acres around the station are devoted to landscape gardening. The cost of maintaining the greenhouses and surroundings at Niles averages $325 a month, during the summer months, and $125 a month during the winter months, thus making a total of about $2,700 a year. This cost includes the flowers and shrubs used in the dining cars and those handed to passengers (on all first-class trains) passing through Niles. Of course the station building, platforms, walks, fences, etc., at such a station must be kept clean and in good repair and in keeping with its lawn.

* Abstract of a paper by Mr. M. Sullivan, of the Michigan Central, presented before the Detroit meeting of the Roadmasters' Association.

With a few exceptions, notably Niles and Ypsilanti, the station grounds along the line of the Michigan Central have been embellished at comparatively small cost. At odd times, during the less busy seasons, particularly the winter months, accumulations of cinders and other rubbish may be used in grading station grounds, and in the spring grass seed is sown where sodding cannot be afforded. A few plots of flowers can then be set out by the head gardener, and the whole kept in good condition by the agent at the station; should any particularly onerous work be required, it can be done by the trackmen.

Water must be provided during the summer months, otherwise the grounds cannot be kept in good condition. For places not supplied with water, flowering shrubs and vines can be made the principal features. If these are selected and placed with judgment and taste, a very pleasing effect can be obtained, costing practically nothing for maintenance. The grounds should be levelled off, cinder-rolled and well raked. Gravel or cinder paths should have the lines well marked. All refuse and rubbish must be cleared away and the outbuildings arranged according to a definite plan and kept in good repair.

The advantage derived from a systematic embellishment of station grounds is that it is the best possible advertisement the road can offer. Such grounds indicate careful management, industrious employees, and an honest endeavor of the road to please its patrons. The effect on station agents is very gratifying, each trying to keep his grounds clean and attractive. Seeing the station grounds well kept, prompts the trackmen to keep the right-of-way clean, especially around the car houses and other buildings under their charge. It is believed that passengers fully appreciate the endeavor to make the road attractive and that, other things being equal, they prefer to travel by the most attractive route.

Traffic on "Chicago Day."

The traffic on the Chicago elevated and surface lines October 9, "Chicago Day," was probably the heaviest ever handled by those roads. On that day the Metropolitan Elevated handled 186,390 people, the South Side Elevated 169,987, and the Lake Street Elevated 85,438, making a total of 441,815. The business of the principal surface roads was approximately as follows: Chicago City Railway, 375,000; West Chicago, 350,000; and the North Chicago, 225,000 people. Last year, on October 19, at the time of the "Peace Jubilee," the elevated roads carried 368,764 passengers. It is estimated that the steam roads brought in about 180,000, one-third being handled by special excursion trains or through trains with extra cars.

During the hours between 9 and 11 p.m., when the crowds were returning from the night parade, the train movement on the inside track of the Union Loop, used jointly by the Metropolitan and South Side roads, was as follows:

	No. trains.	No. cars.
m 9 to 10	62	296
m 10 to 11	46	218
	108	514

During the first hour slightly over a train a minute was handled, and the average train was about 5 cars in length. This train movement was practically maintained on the inside track of the Loop from 7 a.m. to midnight, 17 hours, during which time 1,002 trains containing 4,702 cars were moved; the average train was therefore 4.7 cars to the train, and an average of almost a train a minute for the whole time. There were no important delays during this time and no accidents. This test shows that the full capacity of the Union Loop on ordinary occasions will probably not be reached for some years to come. During the two hours above mentioned, 36,867 fares were paid on the Loop for the Metropolitan and South Side trains, an average of 307 passenger a minute loaded throughout the two hours, an average of 341 passengers per train or 72 passengers per car.

A Shay Geared Locomotive.

The Salt Lake & Mercur Railroad gave on order on Sept. 20 to the Lima Locomotive & Machine Co. for a Shay geared locomotive similar to the one shown in the accompanying engraving, to be delivered by March 18, 1900. This locomotive will weigh 50 tons in working order, have 12 in. cylinders with 12 in. stroke. It will have 32 in. drivers, a wagon top boiler 46 in. in diameter, and the working steam pressure will be 150 lbs. There will be 129 2-in. tubes 108 in. long made of charcoal iron, and the firebox, which will be 72½ in. long and 40⅛ in. wide, will be of special firebox steel. The tank capacity for water will be 2,000 gallons and coal capacity three tons. The wheel centers will be of cast iron and the steam brake will be of the patent of the Lima Locomotive & Machine Co. A siphon will be provided to supply the tank.

The special equipment and the names of the makers are as follows:

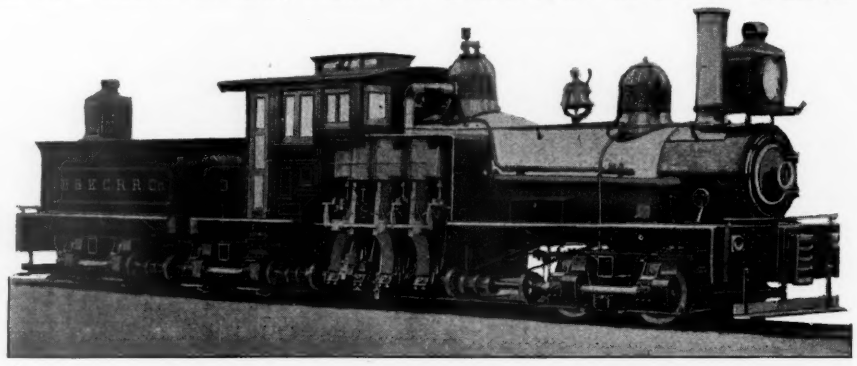
Air brakes, Westinghouse; axles, Bass Foundry & Machine Co.; brake beams, Sterlingworth; brake shoes, flanged (Lima Locomotive & Machine Co.); couplers, cast iron; headlights, Dayton; injector, Monitor; piston rod and valve rod packing, metallic; safety valve, Kunkle pop; sanding devices, Leach's (American Locomotive Sander Co.); sight-feed lubricators, Detroit Lubricator Co.; springs, Detroit Steel Spring Co., steam gages, Ashcroft.

Some French Rolling Stock Orders.

The Northern Railroad of France has ordered 164 corridor carriages on swinging trucks for use in its express trains, especially in view of the Exposition, and they will probably be done in time for the summer of 1900. The State Railroad, needing 10 engines for express trains, was obliged to place the order in the United States because the French builders were not able to promise them in time for the Exposition. A Paris journal seeks to ascertain where the trouble is and concludes that the contracting companies are at fault for not having sufficient facilities, but that the primary fault is with the railroad companies for not foreseeing their needs long enough ahead. One way of getting at this is by a tabulation of returns from the rolling stock, from which it appears that from 1890 to 1898 the receipts per unit of rolling stock increased 12 per cent., while the amount of rolling stock increased but four per cent. To-day the orders placed since January, 1899, amount to 484 engines, 2,372 passenger cars and 9,198 freight cars of various sorts, but the French locomotive shops have a capacity for only about 300 engines a year while the companies themselves can build about 50.

The Western Railroad, having need of 20 engines for its express trains, placed contracts for 10 in Austria and will build the other 10 in its own shops. The Belt Railroad of Paris has not been able to procure from contracting builders the 15 engines which it needs. The Northern placed its orders for its locomotives in its own shops in good season, but is bothered by slow delivery of material.

An officer of one of the contracting companies said that they stood three or four years with nothing to do, when all at once they were overwhelmed with orders, quite disproportionate to their resources either in men or material, and he asks how the contractors can be expected to come to time. This same Paris journal has collected figures to show that the deliveries and orders for locomotives from Jan. 1, 1899, to 1900, are: The Lyons Company 240, the Western 105, the Orleans 53, the Southern 26, the Eastern 22, the Belt of Paris 15, the Northern 13, the State 10. Naturally, the French journal, like some in this country, wants to blame somebody, but does not know precisely whom to blame for the fact that people have not placed their rolling stock orders in such way that the shops could go on delivering regularly from year to year something like their normal output.



Standard Type Shay Geared Locomotive.

The Progressive Development of the English Coupling.

BY W. D. PHILLIPS.*

The question of automatic couplings is engagi-g so much attention that a short sketch showing the stages by which the English coupling has diverged from the American form cannot fail to be interesting.

The link and pin coupler, which until quite recently has been in use on the American railroads, is practically identical with that in use on some of the English railways 50 years ago. My railway experience goes back 40 years, and it had been discarded before my time.

The earliest form of coupling which I remember in use is that shown in Fig. 1. It consisted of seven links with a D link and pin at each end. The drawbars of the wagons were flat and had a perpendicular hole through them. The wagons having been brought buffer to buffer, the brakeman went between them and having adjusted the holes in the D links to the holes in the drawbars, slipped the pins through and thus made the connection. The uncoupling was, of course, done in the same way.

This was pretty dangerous, but not quite so bad as the stiff pin of the American link and pin coupler, as the links allowed the coupling to adjust itself easily to the varying heights of the drawbars of loaded and unloaded wagons.

It was at this very early stage that the English and American practice diverged. The stiff pin, which was practically coupling and buffer, in the English case developed into the present 3-link coupling and side buffers, and in the American case into the combined buffer and automatic coupler.

The next form of coupling which came into use was that shown in Fig. 2. It will be observed that the hole through the drawbar is horizontal; the pin, which passes through it and the D link, is riveted over so that the coupling is now fast to the wagon, the D link at the other end of the coupling being superseded by a hook which, when the buffers were brought together, was hooked by the brakeman into the D link of the adjoining wagon. This was a considerable improvement on the previous form. It was easier to manipulate and there were no loose parts to get lost.

Fig. 3 shows the next step. The hook, instead of being at the end of the coupling, is now the end part of the drawbar and the coupling consists of the D link, three short links and one long one.

Fig. 4 shows the present standard English wagon coupling, 4a being Gedges' patent form of the same. This form of coupling was approved by the Railway Clearing House Association of General Managers of the English railways in 1889, and all the wagon stock in Great Britain is now fitted with it.

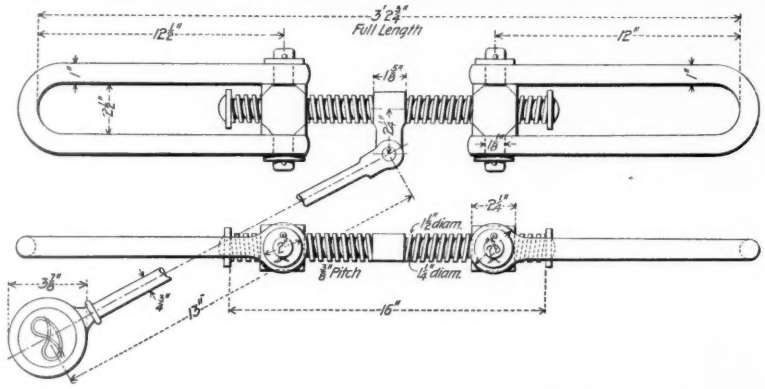


Fig. 6.—Standard English Passenger Car Coupler.

By means of a light ash staff like an alpenstock with an iron hook at the end the brakemen couple and uncouple without getting between the wagons, and with the greatest rapidity and without the slightest risk. Coupling contests are very popular among the English train hands, and a man has at one of the contests frequently uncoupled and again coupled up a train of 20 wagons in less than two minutes.

The advantage of Gedges' patent is that a flat place is worked on the long side of the link so that if the coupling breaks it can be lifted out and replaced in a few seconds.

The coupling in use on coaching stock, i e., passenger coaches, horse boxes and other vehicles which go by passenger train, differs from that in use on the wagon stock. The center link of the three is replaced by a right and left-hand screw which is

*General Manager North Staffordshire Railway.

tightened up so as to leave no space between the buffers, whereas between the wagon buffers there is a space of 4 to 6 in.

Another difference between English and American practice is in the brakes of the wagons. In England they are always worked by levers at the side of of the wagon by men standing on the ground. The brakeman never leaves his brake van when the train is moving to run along the wagons to put down the brakes. There are far too many bridges for such a practice to be permitted. Except they are intended to run on passenger trains, wagons are never fitted with either vacuum or Westinghouse brakes.

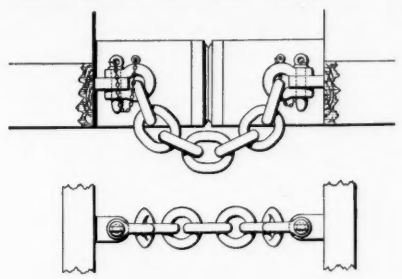


Fig. 1.

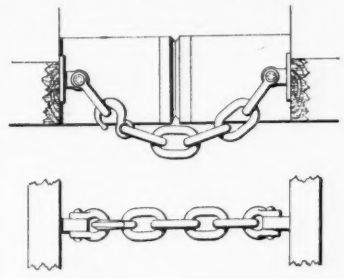


Fig. 2

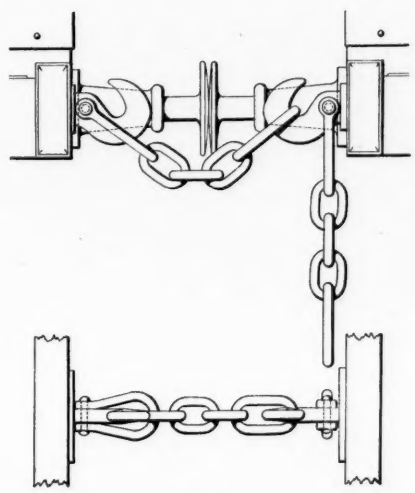


Fig. 3.

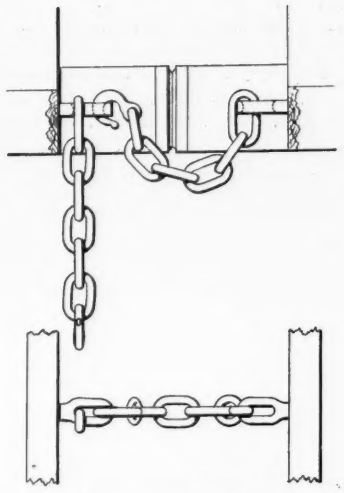


Fig. 5 (an old type.)

Development of the English Freight Car Coupler.

The Early History of Malleable Cast Iron in the United States.*

George C. Davis.

Malleable cast iron, or malleable iron, as it is commonly called, is made from pig iron low in silicon, sulphur and phosphorus, and from which the carbon has subsequently been largely removed by annealing at a red heat in iron ore, mill scale or some other porous or infusible substance. When cast the iron is white in fracture and as brittle as glass, owing to the carbon which is present to the amount of about 3½ per cent., being in chemical combination with the iron. During the annealing at a red heat, the carbon, which is at this temperature in a state of solution in the iron, gradually diffuses. As it comes into contact with the surrounding packing it is oxidized and passes off as a gas which can be seen burning at the cracks in the clay luting of the pots. There is a variable amount of carbon retained in the casting, but it exists in a form like graphite in ordinary cast iron. The diffusion of carbon in iron, even at a bright red heat, takes place slowly, and hence only castings of small cross-sections can be decarbonized to any appreciable extent. In castings less than ¼ in. in diameter practically all the carbon can be removed. We have, then, a product between cast and wrought iron. Its tensile strength is 45,000 lbs. to 52,000 lbs. per square inch, and its elongation is 3 to 7 per cent.

The first malleable iron castings of domestic manufacture were produced in Newark, N. J., in 1826. Seth Boyden, to whom belongs the honor of doing this, was a native of Foxboro, Mass., but settled in Newark in 1815, when in his twenty-seventh year. He built a locomotive called the "Cometa," for the Cardenas Railway of Cuba, and went there himself, in 1841, to put the engine in operation. He died, a poor man, in the year 1870.

General Runyon, in his address at the dedication of Boyden's monument, said: "What is called malleable iron was known before Mr. Boyden discovered it, but he invented it as truly as ever a man invented anything wholly new and previously unknown." This view has been held by many, but I believe it to be clearly in error. About the time Boyden began his experiments he had in his possession some malleable castings that had been made in England.

Reaumer had published the fundamental principles of the process in the year 1722, and some years later patents were granted in England for softening castings by annealing in ashes. In 1804 Sam Lucas, of Sheffield, took out a patent on malleable iron, but be believed the difficulties to be insuperable and so made no use of his patent in a commercial way at least. His brother, Thomas Lucas, shortly after took up the matter, and succeeded in producing cast cutlery which, according to Parks' "Essay on Edge Tools," 1815, would take as fine a polish as the best cast steel. These articles were sold under the name of run steel. According to Percy and other authorities, the use of malleable castings rapidly extended, and by 1830 the industry had attained large proportions. The castings were used for cutlery, pulley blocks, carriage and harness hardware, and a variety of other purposes. Thus we see that malleable iron had been manufactured in England for some years before Boyden began his experiments.

In 1828, the Franklin Institute offered a silver medal for the best specimen of annealed cast iron, to consist of not less than one dozen pieces. The report of the committee of that Society says: "Premium No. 4, for the best specimen of annealed cast iron, is awarded to Seth Boyden, of Newark, N. J., for specimen No. 163, being an assortment of buckles, bits and other castings, remarkable for their smoothness and malleability. This is the first attempt in this country to anneal cast iron for general purposes that has come under the knowledge of your Committee, and success attending it, fully entitles the maker to a silver medal."

The foundry which Boyden erected was located at 28 Orange Street, in the rear of his home on Bridge Street. It gave employment to about sixty moulders. At first, and for much of the experimental work, the iron was melted in a crucible, heated with charcoal or hard coal. An air furnace was soon built with a capacity of about 1,000 lbs. The fuel was dry pine wood or soft coal, and it is said that eight heats a day were made, starting at 3 a. m. and often not finishing until late in the evening. This furnace was not tapped, the iron being dipped out in clay-washed ladles, holding from 10 to 12 lbs. each.

The first cupola was built in 1832 and used hard coal. This cupola was of the solid bottom type, and consisted of a straight shaft, the upper part of which could be lifted off to allow cleaning and repairs after a heat. The probable reason for this design was the small size of the cupola, which was said to be about 18 in. in diameter. By this arrangement cleaning and repairs to lining were more easily made. The use of cupolas and air furnaces for melting malleable pig was, up to a comparatively recent date, peculiar to this country, it still being the practice in many foreign works to use crucibles. The first annealing furnace was shaped like a beehive and the pots were inserted from the top, which could be removed by a crane. Mill scale was packed around the pots and whole kept at an annealing heat for a week. This type was succeeded by a rectangular furnace, which was run continuously.

The extension of the malleable iron industry was very rapid, and several foundries were started in various places at about the same time. Many of the concerns were short-lived, as they suffered from the financial troubles of 1837 and the difficulties encountered by any new process. There are at present at least five coke blast furnaces that produce largely malleable pig. Two of these are in New York State, and one each in Pennsylvania, Illinois and Tennessee, so the source of supply is not centralized. The coke malleable differs from the charcoal in being a trifle higher in sulphur and considerably higher in manganese. The difference in sulphur is not great enough to be of any importance where the iron is melted in an air furnace, while the high manganese renders it desirable for mixing with charcoal irons, which are, as a rule, too low in this element. Coke malleable has now been in use for about fifteen years, and its consumption is undoubtedly increasing. It was thought at one time that some of the numerous steel casting processes would replace malleable iron. By steel I mean the product of the open-hearth or modified Bessemer, and not any of the numerous semi-steels. In the heavier classes of work this has to some extent proven true, but, as a rule, the two processes are developing along different lines. The difficulties of preparing small moulds to withstand the high temperature of steel, and the more costly plant necessary for its production, will probably prevent its use for small or intricate castings.

* Abstract of a paper read before the Franklin Institute, Jan. 25, 1899, and published in the Aug.-Sept. number of the Journal of the Franklin Institute.

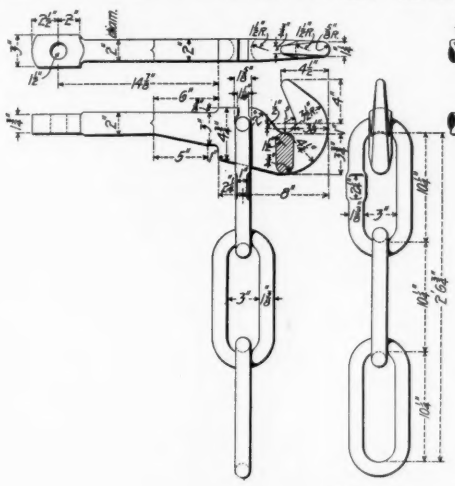


Fig. 4a.

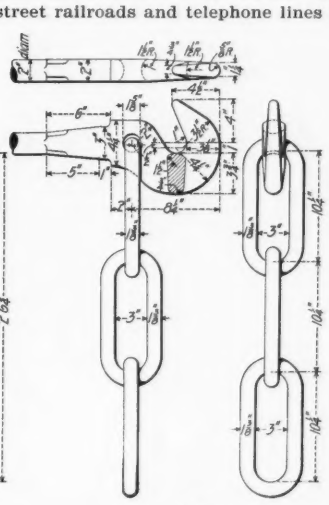


Fig. 4.

Standard English Freight Car Coupler.

Foreign Railroad Notes.

The Hungarian authorities have ordered the construction of 2,000 houses in the suburbs of Budapest for the accommodation of employees of the State Railroads. If suitable ground can be had, 4,000 more workmen's houses are to be built.

A bill is pending in the Italian Parliament, introduced by the government, which provides that employees of the railroads, the postoffice and telegraph, the street railroads and telephone lines between different places, the State workshops and arsenals, the public gas or electric lighting enterprises and waterworks, whether these enterprises are worked by the State or by corporations, shall be liable to a fine of 1,000 francs or imprisonment for three months if to the number of three or more they agree to stop work, or in any way neglect their duties so as to hinder the regular course of the service. And an individual, without any agreement, is to be similarly liable, when he abandons his duties at a time when such an act causes the service to suffer.

RAILROAD GAZETTE

ESTABLISHED IN APRIL, 1856.
PUBLISHED EVERY FRIDAY,
At 32 Park Place, New York.

EDITORIAL ANNOUNCEMENTS.

Contributions.—*Subscribers and others will materially assist us in making our news accurate and complete if they will send us early information of events which take place under their observation, such as changes in railroad officers, organizations and changes of companies in their management, particulars as to the business of the letting, progress and completion of contracts for new works or important improvements of old ones, experiments in the construction of roads and machinery and railroads, and suggestions as to improvements. Discussions of subjects pertaining to* ALL DEPARTMENTS *of railroad business by men practically acquainted with them are especially desired. Officers will oblige us by forwarding early copies of notices of meetings, elections, appointments, and especially annual reports, some notice of all of which will be published.*

Advertisements.—*We wish it distinctly understood that we will entertain no proposition to publish anything in this journal for pay,* EXCEPT IN THE ADVERTISING COLUMNS. *We give in our editorial columns* OUR OWN *opinions, and those only, and in our news columns present only such matter as we consider interesting and important to our readers. Those who wish to recommend their inventions, machinery, supplies, financial schemes, etc., to our readers can do so fully in our advertising columns, but it is useless to ask us to recommend them editorially either for money or in consideration of advertising patronage.*

On another page Mr. H. H. Westinghouse has something to say concerning the Westinghouse friction draft gear, and he speaks with that convincing moderation of statement for which he is famous. He omits, with deliberate intention, no doubt, to mention one of the most important points about this rigging, namely, the fact that the great amount of energy which it is shown to absorb is absorbed without recoil. Probably he thought that it was enough to speak of one thing at a time and wished to make his letter short. He confines himself to pointing out the great proportion of the energy of the moving masses which can be disposed of by this gear. Probably he takes it for granted that everybody knows that it is impossible to dispose of anything like that amount of energy by a spring buffer because it is impracticable to prevent the recoil of the springs. It has been demonstrated many times that this recoil is a fruitful source of break-in-twos. If a train is bunched and then begins to stretch out, and the spring reaction works together with the forward pull of the engine and of the moving cars, the best coupler ever made is liable to break some time; it is only a question of the combination of these forces. Furthermore, the friction gear is working all the while in tension, as well as in compression, giving to the train a singular smoothness of running and freedom from surging. To this we can testify from experience and careful observation.

The rapid transit situation in New York City is again interesting. It looks now as if the contract to build the underground railroad might be let. The Commissioners are trying to get authority to reduce the bond to something less than 15 million dollars, which, with a cash deposit of one million dollars, is the guarantee that the contractor must put up. This in itself is a heavy handicap to the bidders. The contract as it will be offered will be for building the whole railroad from City Hall Park to the northern limit of the city on the west side and to Bronx Park on the east. A main line stem will go from City Hall Park northward and westward to about 106th Street, where the branching east and west will take place. This main stem will have four tracks. The contract will call also for equipping and working the road for 50 years with an option to renew for 25 years. Aside from the very heavy bond, the terms of the contract are not illiberal, and yet the city is well protected. On the other hand, the contractor will work under a contract having the guarantee of the fundamental law of the land and not under a franchise subject to legislative assaults. This in itself is a very important matter. He is exempted from taxation under the laws of the State, and also is secured against annoyance by injunction or damage suits on the part of abutting property holders. We should not be at all surprised if the Metropolitan Street Railway Company were a liberal bidder for this contract, for reasons which we pointed out in writing on the subject last spring. Another matter of importance is the continued forward movement of the Manhattan Elevated. Contracts for the steam machinery and for the third rail are let, ground is broken for the power house and the preparation of plans and specifications for the electrical equipment is being pushed fast.

Freight Car Capacity and Loading.

A rather interesting question was discussed at the last meeting of the St. Louis Railway Club; whether the average loading of freight cars during the past 15 years has increased in the same ratio as the car capacity. It was shown from records of the Wiggins Ferry Company that in 1878 the average loading of 101,596 cars was 9.4 tons; in 1896, when 426,216 loaded cars were handled, the load averaged a little more than 15 tons per car, while so far this year the average has been about 17 tons. The average car capacity was taken as 12 tons in 1878 and 30 tons in 1899. The average loading in 1878 would therefore be 78 per cent. of the carrying capacity and about 57 per cent. in 1899; further, it was thought some traffic officer should explain why this ratio has decreased.

Also, statistics of the traffic over the St. Louis Merchant's Bridge showed that in 1877 and 1878 the average loading per car was 9.45 tons, and this has increased gradually, being 11.21 tons in 1881, 13.28 tons in 1885, 14.73 tons in 1890, 15.45 tons in 1895, and 16.44 tons in 1898. Mr. Webster, of the Terminal Railway, who furnished these latter figures, states that he is unable to say what is the average carrying capacity of freight cars at this time, and that it is purely a matter of guess work. In this he is quite right, and any one who looks over recent lists of the freight equipment of the different roads will see that it is very misleading to assume that the average carrying capacity of freight cars is 30 tons. On the other hand, it is probably safe to say that there are now more cars running that range from 28,000 to 50,000 lbs. capacity than there are cars of 60,000 lbs. and larger.

The first 60,000-lb. cars were built for trial in about 1885 and it was almost five years later before the M. C. B. Association saw fit to adopt a standard 60,000-lb. axle; even then the majority of roads had not begun to use the larger cars. Some time must therefore elapse before all the small capacity box and coal cars are replaced, and the building of flat, stock, refrigerator and furniture cars of 60,000 lbs. capacity is even now exceptional. It is true that a few of each kind have been built, but only under unusual conditions can they be loaded to full capacity. Box, coal and ore cars alone have generally been made larger, which seems to be a fact that is often overlooked when people talk about the average carrying capacity of cars; further, they seem to lose sight of the large number of small box and coal cars now running.

The official reports published in the Railway Equipment Register show that only on a few roads, which have bought large numbers of cars within the last few years, are the large and small cars anywhere near equally divided. Thus the Baltimore & Ohio now has about 25,000 cars of 60,000 lbs. capacity and over, out of about 40,000 cars; and the Pittsburg, Bessemer & Lake Erie has about 4,000 cars, all being large except some 500 flats and gondolas of 50,000 lbs. The New York Central has more than 13,000 box cars ranging from 28,000 to 50,000 lbs. and about 12,000 of 60,000 lbs. capacity, while the Lake Shore & Michigan Southern has over 7,000 small box cars and about 4,000 of 60,000 lbs.; but each of these roads has about twice as many large coal cars as small ones. Two-thirds of the equipment of the Wabash and one-half that of the Illinois Central, Erie and Union Pacific, and less than one-third the equipment of the Chicago & Northwestern is of 60,000 lbs. capacity or more. Then there is a larger number of roads as the Michigan Central, Philadelphia & Reading, Delaware & Hudson Co., New York, Chicago & St. Louis, Canadian Pacific, Great Northern and Northern Pacific where less than one-fourth the freight cars are 60,000 lbs. The Atchison, Topeka & Santa Fe is one of the large roads with many small cars; all but about 2,000 out of 25,000 are of 40,000 and 50,000 lbs. capacity. The Grand Trunk, Lake Erie & Western, and Cincinnati, Hamilton & Dayton, and the majority of the smaller roads have practically all small cars.

Evidently to determine with any accuracy the average carrying capacity of the freight cars used to haul a given tonnage, it would be necessary to keep records of the marked capacities of cars similar to the records of the loading. It goes without saying, however, that the average capacity is less than 60,000 lbs., and those who are well qualified to guess are inclined to place the average carrying capacity between 45,000 and 50,000 lbs. This accounts for a large part of the apparent decrease in the ratio of capacity to loading as determined from the Wiggins Ferry Company's records.

State Ownership of Railroads.

The Democrats of Massachusetts are trying to make an "issue" of state ownership of the Boston & Albany Railroad. In the platform, adopted at their recent convention, they declared unequivocally in favor of the purchase of this property by the state, under the permissive clause in the company's charter. They say that the state could either operate the road directly or lease it to the New York Central; and if it should lease at 8 per cent., while paying for it with money borowed at 3 per cent., it would make a handsome profit. The amount of this profit is overstated tenfold or more, but that is not much of an exaggeration for a political platform. A correct estimate of the profit would make it $1,250,000 (5 per cent. on $25,000,000). How it could be made equitable to pay par for shares worth 250 is an ethical question which the Democrats and the economists who discuss the matter do not have much to say about.

It is not likely that the Democratic party of Massachusetts will have much influence with the voters of the state this year, for the Silver faction is in control and the more intelligent element of the party will vote with the Republicans, or not vote at all; but the mere declaration, albeit only a plank in platform, has incited considerable discussion, perhaps because the elusive "trust" problem, with its unsolvable puzzles, is becoming tiresome, or because state ownership also has problems which are unsolvable and therefore always safe to talk about.

We do not propose to take up the well-known arguments for and against state ownership. The evils of a Bureaucracy, chief among which is the deadening of all enterprise in the management of a railroad, may be said to comprehend the objections to state ownership, and the danger of dishonest or short-sighted treatment of public duties is the objection to private management. As the fitness of the executive department of our government to manage a great business (whether we consider the Federal or the several state governments) has not materially improved in the past dozen years, there is little that is new that can be said in favor of state ownership; and as the legislatures, state and Federal, have not grown decidedly worse, as regards their competency to regulate privately owned railroads, there is nothing new to be said against private ownership.

But there are a few features peculiar to the Massachusetts situation which may be worth a moment's notice. Railroad abuses have been felt more severely in other parts of the country than in New England; so that in discussing state ownership, with the Boston & Albany as a text, every editor or writer seems to have in view the country as a whole; he considers general principles. And yet the case of the Boston & Albany has few, if any, parallels anywhere. In the first place the government of Massachusetts is more intelligent and statesmanlike than that of perhaps any other state. This being so, a successful experiment there might afford no light whatever on the problems of another state. Again, the Boston & Albany property has been so prudently conserved and the population along its lines is so dense that a good showing might be made for ten years by new managers who, on most other railroads, would come to grief in three years.

Massachusetts has made two railroad experiments in recent times; the Hoosac tunnel and the Boston, Hartford & Erie (which became the New York & New England). In both cases the memories are malodorous, and the state sank millions of dollars in the enterprises. These old cases are not parallel to that now before the public, and yet they are brought forward as arguments against buying the Boston & Albany. Whatever may be the reasons for not buying the Boston & Albany, the piercing of a mountain when a tunnel was not needed, and the building of a competing line to Fishkill which never became able to compete, are not among them.

The business of the Boston & Albany being capable of producing a large profit, what should the state do with the money? With most railroads the problem would be to find ways and means to give decent public service at rates which would not be so high as to check the prosperity of the community generally; but here there should be a good profit every year at the rates now prevailing, and these do not seem to be higher than the traffic will bear. The problem would be complicated in any event. To reduce rates might force reductions on other

roads, in adjacent territory, and do those other roads an injustice. To use the profit for general purposes of the state would be taxing the patrons of the Boston & Albany for the benefit of other citizens. The state pays half a million dollars annually for the elimination of grade crossings; would it be equitable to put Boston & Albany money into this fund and use it on the Boston & Maine or the Fitchburg? Another question that would be constantly coming up would be that of profits in extra good years; should they be saved for lean years or given at once to the public? The differences on this point in railroad companies whose stockholders are part Englishmen and part Americans afford an illustration of what might be expected in the Legislature at Boston. The road would probably be a football in that body every winter, in any event; but a road with a fat treasury would make a more exhilarating game than roads of the average kind.

These points serve to show to what a considerable extent it may be necessary, whenever we take up a concrete case, to modify the general considerations and arguments which serve so well as long as we consider state ownership from the academic standpoint, which is the standpoint that has been most commonly adopted in recent years. And, while the exceptional intelligence of public opinion in Massachusetts, and the high character of the men who fill the offices in that state are circumstances which would be likely to secure a wiser treatment of the experiment of public ownership there than in some other states, it is still to be borne in mind that an experiment of this kind extends, or should extend, over a considerable term of years, and therefore that prudence requires a careful look into the future. The dangers of official corruption and inefficiency are not to be ignored, in Massachusetts or elsewhere.

August Accidents.

Our record of train accidents in August, given in this number, includes 89 collisions. 100 derailments and 4 other accidents, a total of 193 accidents, in which 39 persons were killed and 154 injured. The detailed list, printed on another page, contains accounts only of the more important of these accidents. All which caused no deaths or injuries to persons are omitted, except where the circumstances of the accident as reported make it of special interest.

These accidents are classified as follows:

COLLISIONS.

	Rear.	Butting.	Crossing and other.	Total.
Trains breaking in two	12	0	0	12
Misplaced switch	4	0	6	10
Failure to give or observe signal	4	0	1	5
Mistake in giving or understanding orders	1	5	0	6
Miscellaneous	10	1	6	17
Unexplained	11	12	16	39
Total	42	18	29	89

DERAILMENTS.

Broken rail	1	Careless running	1
Loose or spread rail	3	Track repairers	2
Defective switch	1	Bad switching	1
Broken wheel	5	Bad loading	2
Broken axle	12	Too quick application of vacuum brake	1
Broken truck	1	Runaway	2
Brake hose burst	1	Animals on track	4
Failure of drawbar	2	Washout	2
Failure of drawbar and automatic application of air brakes	3	Malicious obstruction	2
Loose cowcatcher	1	Accidental obstruction	5
Misplaced switch	7	Unexplained	41
Derailing switch	1		100

OTHER ACCIDENTS.

Broken siderod	2
Cars burned while running	1
Other causes	1
	4
Total number of accidents	193

A general classification shows:

	Collisions.	Derailments.	Other accid's.	Total.	P. c.
Defects of road	0	5	0	5	3
Defects of equipment	13	25	2	40	20
Negligence in operating	37	16	2	55	29
Unforeseen obstructions	0	13	0	13	7
Unexplained	39	41	0	80	41
Total	89	100	4	133	100

The number of trains involved is as follows:

	Collisions.	Derailments.	Other accid's.	Total.
Passenger	34	18	2	54
Freight and other	127	84	2	213
Total	161	102	4	267

The casualties may be divided as follows:

Killed.	Collisions.	Derailments.	Other accid's.	Total.
Employees	20	10	0	30
Passengers	4	0	0	4
Others	0	4	1	5
Total	24	14	1	39
Injured.				
Employees	63	32	0	95
Passengers	31	12	0	43
Others	6	10	0	16
Total	100	54	0	154

The casualties to passengers and employees, when divided according to classes of causes, appear as follows:

	Pass. Killed.	Pass. Injured.	Emp. Killed.	Emp. Injured.
Defects of road	0	0	0	2
Defects of equipment	0	5	4	12
Negligence in operating	4	31	20	67
Unforeseen obstructions and maliciousness	0	0	4	5
Unexplained	0	7	2	9
Total	4	43	30	95

Twenty-three accidents caused the death of one or more persons each, and 48 caused injury but not death, leaving 122 (63 per cent. of the whole) which caused no personal injury deemed worthy of record.

The comparison with August of the previous five years shows:

	1899.	1898.	1897.	1896.	1895.	1894.
Collisions	89	83	64	48	53	25
Derailments	100	94	61	54	71	89
Other accidents	4	5	3	2	8	9
Total accidents	193	182	128	104	132	150
Employees killed	30	26	17	39	30	25
Others killed	9	17	15	18	19	35
Employees injured	95	93	55	53	41	94
Others injured	59	158	85	87	99	42
Passenger trains involved	54	58	36	35	48	44
Average per day:						
Accidents	6.23	5.77	4.13	3.36	4.26	4.84
Killed	1.26	1.39	1.03	1.52	1.58	1.61
Injured	4.97	8.10	4.52	4.52	4.52	4.39
Average per accident:						
Killed	0.20	0.24	0.25	0.45	0.37	0.33
Injured	0.80	1.38	1.10	1.34	1.06	0.90

The most fatal passenger train accident in August was that due to runaway freight cars at Arlington, N. J., on the 30th. A coroner's jury has found that the runaway was due to the failure of a brake chain. The accident most disastrous to traffic was the explosion in a tunnel near Somerset, Ky., on the 8th, blocking all trains a whole week. At Grand Beach, Me., on the 17th, there was a collision of freight cars in consequence of the accidental extinguishment of a brakeman's lantern just at the moment when he needed the light to give a signal.

Seven persons were killed in the derailment of a passenger train on the Canada Atlantic near Coteau Junction, Ont., on August 9. All of the victims were severely scalded.

The record of accidents to street cars was longer in August than for many months, the number of accidents being 22, and of casualties 120 (31 killed and 89 injured). Seventeen of the accidents, however, caused no fatal injuries. Twenty-nine persons were killed in a single disaster, that at Stratford, Conn., on the 6th.* This derailment, which resulted in a loaded car falling off a bridge, was reported in the Railroad Gazette of Aug. 25, p. 596. Reckless speed on an unfinished track appears to have been the cause. A car fell off a bridge in a similar way at Merrill, Wis., five days afterward, but there were not many persons in the car and only five were injured. One of the fatal street car derailments was due to the accidental weakening of a bridge at Nashville, Tenn., on the 4th. A support of the bridge was knocked down by a derailed freight car, and the derailment appears in the train-accident record. A butting collision of electric cars near Wickford, R. I., on the 6th, killing one person, was followed by a fire which completely destroyed both cars. A butting collision of two heavily loaded cars at Plymouth, Pa., where 30 persons were injured, three of them fatally, is reported to have been due to some trouble with electric light signals which were depended upon, wholly or partially, to indicate to motormen whether or not they had the right of the road from one meeting-place to another. Twelve of the 22 street car accidents were collisions.

*On the same day 29 passengers going from an excursion train to a boat were drowned at Mount Desert Ferry, Me., by the failure of an overloaded gang plank.

The Right to do Freight Business on Street Railroads.

The decision of the Supreme Court of New York, Appellate Division, in the suit against the Brooklyn Heights and other street railroad companies on Long Island, sustaining the right of those companies to run cars to carry freight, was briefly reported in the Railroad Gazette of Oct. 14. It is an exhaustive discussion of the laws of the State of New York, as affecting the power of street railroad companies to do other than passenger business, and it shows that the general law of 1884 establishes the right to carry freight on street railroad tracks throughout the States.

The decision, by Judge Hatch, sets forth in a lucid manner the relations to the general law of various statutes which had been claimed to restrict this right, and he cites decisions of the higher courts to sustain his views. The substance of the decision follows:

There can be no doubt that the Legislature has power to authorize the carriage of freight on street lines. In special acts it has limited certain companies to carrying passengers, but in certain other acts it has specifically empowered companies to convey passengers and freight.

The Brooklyn Heights Company was created by the act of 1884, which was the first general act relating exclusively to street surface railroads. This law grants authority for the "conveyance of persons and property in cars for compensation." The other two defendant roads, the Long Island Electric and the Queens County & Suburban, were organized under the general railroad law (of earlier date). Street railroads were extensively incorporated under the general railroad laws of 1848 and 1850 and such corporations were sustained by the Court of Appeals (W. S. A. & P. 115, New York, 442; decision by Judge Peckham). This decision refers to the fact that an exception is made of the city of New York.

Chapter 140 of 1854 modified the earlier law, but Judge Hatch holds that the revised language is general, and does not indicate a fixed purpose to create a general limitation; and in any event subsequent legislation has put the matter in clear language. The general street surface railroad law of 1884, Chapter 252, is broad and specific, and authorizes the formation of companies to carry persons and property in cars on a street surface railroad. In 1886, Chapter 65, the matter was made still plainer by the use of the phrase "passengers, mails or freight." This language is retained through the subsequent amendments and revisions. The revision commission had before it all of the railroad legislation of the State, and must be presumed to have known of the decisions of the courts interpreting those laws; and as having intentionally made use of the words originally in the text. Section 36 of the general railroad law forbids railroad companies to stop cars, horses or locomotives on any crossing of another railroad company "for the purpose of delivering passengers or freight." Authorities are cited to show that the revision of a law does not, ipso facto, work a change in its construction; this can be effected only by such change in wording as will indicate an intent to establish a different rule.

In virtue of all the foregoing the defendant railroads were acting under lawful authority when they made the contract with the National Express Company to carry its freight.

Plaintiffs claim that the law, in referring to "property," meant the baggage of passengers, but Judge Hatch shows by easy reasoning that this would be very strained construction. The word "fare" is used in Section 101 of the general railroad law, and has been claimed to indicate that the act contemplated only passengers and not freight. This is a fallacious claim, as Section 101 deals exclusively with passengers. Sections dealing with both passengers and freight use the word "compensation."

The defendants, the Brooklyn street railroads, have a vested right to carry freight, which may not be impaired by legislation; but Judge Hatch thinks that there is no danger that under this right the companies will run long freight trains, to the inconvenience of the public. The right to use the track is subordinate to the right of the public to the street, and the courts will protect the rights of the public. The street railroad company has the paramount right of use of its tracks, but not the exclusive use. (Black vs. Staten Island E. R. R. 40 App. Div. 238.) It is not clear that the transportation of goods in single cars over the Brooklyn tracks will increase the burden of use of the street; certainly there is no evidence that this method will be more burdensome than would be the carriage of the same freight on wagons.

The reader will note that this closing paragraph of the decision contains the rationale of the whole matter. The question of the justice and equity of the general law hinges very largely on the question whether a given quantity of freight burdens the street any more when carried in a car running on rails than when carried over the same street in wagons. Judge Hatch intimates that this would be the first point to be settled if one were to attempt to attack the statute. Presumably the disturbance to ordinary carriages, wagons and bicycles is less when the street car carries the goods, as the same quality can be carried in fewer vehicles, and it occupies the street a shorter time. Unless freight carriers are to be compelled to go through some other (less crowded) street the mere question of burden on the street could, probably, be settled on very simple reasoning. The question of the right of the street railroad company to monopolize the freight carrying trade on a given street, to the injury of truckmen who have long been in the business, is largely one of taxation, and if taxation is based on gross receipts from transportation, which is the most equitable method, the monopoly should be no more injurious, to other interests, in the matter of freight than it is in passengers. A street railroad whose main business is carrying passengers can never obstruct the streets very seriously with freight cars for the reason that it would be interfering with its own passenger cars worse than with anything else; and the impairment of the efficiency of the passenger service in any such way as that would very quickly be stopped by the force of public sentiment.

TECHNICAL.

Manufacturing and Business.

The Cling-Surface Manufacturing Co. has established a branch in Johannesburg, South African Republic. This does not seem to be an opportune time for extending trade there.

The Simplex Railway Appliance Company, Chicago, is making a number of designs of steel freight cars, and when completed it is proposed to build sev-

eral sample cars in its shops at Hammond, Ind. If these cars, which will be made principally of rolled shapes, prove satisfactory, a new car works will be built, or the present plant will be extended.

McCord journal boxes and lids, made by McCord & Co., Chicago, have been specified for 500 cars for the Pittsburgh & Lake Erie, 1,000 for the Chicago, Lake Shore & Eastern, 350 for the Duluth & Iron Range, and 250 for the New York Central & Hudson River. The orders for these cars were referred to in recent issues.

Arrangements have been made with the Q & C Co. for the exclusive sales of Magnolia Metal to the steam and electric railroad trade throughout the United States, Canada and Mexico.

David B. Carse, president of Carse Brothers Company and manager of the car department of the S. A. Woods Machine Company of Chicago, was married in Cleveland, O., on October 4, to Miss Marguerite Birdelle Switzer of that city.

D. O. Ward will on November 1 discontinue his connection with the Weber Railway Joint Mfg. Co. and resume his former connection with the American Washer & Mfg. Co. as general manager. The Washer Company will now introduce to the railroad trade other track devices. Mr. Ward's successor will be F. R. Coates, Roadmaster of the New York, New Haven & Hartford.

A. M. Richards, formerly superintendent of the Chicago division of the Chicago & Alton Railroad, has accepted a position with the Powers Regulator Company, in charge of the railroad department, with headquarters at 40 Dearborn Street, Chicago.

On October 14, 1899, the National Electric Car Lighting Company sold, assigned, and transferred unto the Electric Axle Light & Power Company its entire assets, consisting of property, patents, and patent rights, contracts, agreements, privileges, and good will. The business formerly done by the National Electric Car Lighting Company will be continued by the Electric Axle Light & Power Company.

Iron and Steel.

The Cumberland Rolling Mills, at Cumberland, Md., formerly owned by the Baltimore & Ohio RR., have been sold to the Potomac Steel Co., recently organized.

The Westmoreland Steel & Mfg. Co., with office in Pittsburgh, Pa., has been incorporated in West Virginia, with a capital of $2,500, with the privilege of increasing it to $250,000. The company proposes to make iron and steel. Among the incorporators are C. S. Knight, Jr., and C. S. Cook.

The Alan Wood Iron Co. is building a new mill to make 96-in. plate at its plant in Conshohocken, Pa.

Mr. Edward Bailey, of Harrisburgh, has been elected President of the Central Iron & Steel Co. to succeed his father, the late Mr. Chas. L. Bailey. A new office of Purchasing Agent has been created and James B. Bailey appointed. George R. Bentley, of Harrisburgh, has been elected General Superintendent to succeed the late John Nathan Binnix.

The Alabama & Georgia Iron Co., with a capital of $1,300,000, was incorporated in New Jersey Oct. 17 to make iron products. The incorporators are Phillips Isham Glenwright and A. F. Marmelstein, of New York, and F. M. Jeffrey, of East Orange, N. J.

The Warwick Iron & Steel Co., of Pottstown, Pa., will issue $500,000 of treasury stock to build a new furnace.

What Can the Master Mechanics' Association Do to Increase its Usefulness?

At the thirty-second annual convention of this Association, President Quayle's address contained a recommendation resulting in the appointment of a committee, and to whom the above subject has been assigned.

Members are now asked to express views, and make any suggestions on this subject for the assistance of the committee in preparing and presenting a report.

They ask for views and opinions, particularly, on the following division of this question: The discussions at the convention, official records of proceedings and their practical value to members and railroads generally; and, in addition, opinions on any phase of the general question which would be for the advantage of the Association to adopt. If possible, this committee would consider it a favor to receive the reply within the next two weeks after receipt of this circular. Reply to T. R. Browne, Master Mechanic. Juniata Shops, Pennsylvania Railroad Co., Altoona, Pa.

Piston Valves.

The Master Mechanics' Association Committee on Piston Valves issues the following circular:

Your Committee appointed to consider the subject of Piston Valves requests that you co-operate by replying not later than January 1, 1900, to the following questions:

1. Have you any piston valves in service? If so, how long have you had them?
2. What advantages have you found in their use?
3. What disadvantages have you found in their use?
4. Do you have any difficulty with piston valves when the engine is drifting? If so, what is the cause and remedy?
5. Do you prefer internal or external admission?
6. Is exhaust any benefit as a jacket for the steam passage?
7. Do you favor a solid valve or one with packing? If packing, state what kind you prefer.
8. Can you get a proper distribution of steam?
9. Is there less wear on eccentrics and links with piston valves than with slide valves?
10. Do you consider a bushing for the piston valve chamber desirable? State reason.
11. Please give any information that you have to show the economy in the use of piston valve. Kindly furnish the Committee with a drawing or blue-print of what you consider the most satisfactory form and location of piston valve.

Please send reply to S. P. Bush, Superintendent M. P., Pittsburgh, Cincinnati, Chicago & St. Louis Ry., Columbus, Ohio.

The Chicago Tunnels.

An outline of the plans prepared by the City Engineer for lowering the tunnels under the Chicago River, at Chicago, and building a rolling lift bridge at Washington Street, was given October 6, p. 697. The estimated cost of these improvements is as follows, the original cost for building the tunnels also being given:

	Original cost.	Estimated cost of improvement.
La Salle Street tunnel	$566,276	$265,000
Washington Street tunnel	517,000	254,000
Bascule bridge, Washington Street		98,000
Van Buren Street tunnel	1,800,000	201,000
Total		$818,000

The legal department of the City has also rendered an opinion on the question of compelling the street railroad companies, which now use these tunnels, to pay for the work of lowering them. It is the opinion of the legal department that the City can compel the surface roads to pay for this work, provided the roads definitely decide to continue the use of the tunnels. Many think this work will be seriously delayed by litigation with the street railroads whose franchises do not expire until 1903, unless the City issues bonds to cover the cost of the improvement pending a decision by the courts.

"Cling-Surface" Preparation for Belts.

In our issue of May 5 last reference was made to a test with belts treated with the compound called "cling-surface" made by the Cling-Surface Manufacturing Co., Buffalo, N. Y. A letter from Prof. Carpenter dated Oct. 5 substantiates the statements made in the report to which we referred in our previous article. More recent tests also indicate higher efficiency of transmission and less loss of power in the case of belts treated with "cling-surface" than in the case of untreated belts, when working under the conditions which existed at the time of the earlier test. Prof. Carpenter points out the fact that the slipping of a belt causes considerable loss of power, the power so lost passing off in heat. The use of "cling-surface" reduces the slipping and consequently reduces the loss of power.

The Nicaragua Canal.

The concession from the Nicaragua Government to the Maritime Canal Company of the United States to build a canal from the waters of the Atlantic to the Pacific has expired and the concession granted to the Eyre-Cragin Syndicate becomes operative.

New Brooklyn Navy Yard Shops.

New proposals for bids for the machine and erecting shops, boiler house and chimney at the Brooklyn Navy Yard are ready. The amount available for this building complete is $350,000. The amount of steel work in the new plans has been reduced; the building has been lowered 6 or 7 ft. and shortened about 40 ft. Some of the crane girders have been omitted and the general design of the steel work has been modified. Plain glass has been substituted for wire glass in the roof, and galvanized corrugated iron has been substituted for considerable of the skylight work in the sides. This building is to replace the shop destroyed by fire last February.

The Navy Department on Oct. 10 opened bids from 31 concerns for machine tools for the Brooklyn Navy Yard. The tools embrace nearly a complete outfit for the new shops mentioned above, and were divided into 137 different classes.

Next Year's Naval Estimates.

Chief Naval Constructor Hichborn, in his annual report, just published, submits estimates for repairs on war vessels which amount to $6,000,000—double the amount of last year. The amount required for the new war ships is $27,409,981, of which $8,676,880 has already been appropriated. Attention is directed to the need of increased facilities for docking. He recommends that an additional drydock of stone or concrete be built at the Brooklyn Navy Yard, and also that two marine railroads be built on the Cob dock at the Brooklyn Navy Yard to handle torpedo boats.

THE SCRAP HEAP.

Notes.

The Southern Pacific is sprinkling its roadbed with oil between Monterey, Cal., and Castroville.

The Intercolonial Railroad, according to a statement in the Halifax Chronicle, is preparing to use coke as fuel in all the passenger locomotives of the road.

An officer of the Delaware, Lackawanna & Western says that that road is to have an industrial commissioner. It is also stated that the management intends to put on an express train to run between New York and Buffalo, 410 miles, in about eight hours.

The Circuit Court of Appeals of Missouri has reversed the decision of the lower court in the suit to compel the Missouri Pacific to carry a bicycle as baggage. The higher court holds that bicycles are neither a necessity nor a convenience to a passenger, in the sense that those terms are used in defining baggage, and the road is sustained in refusing to accept the bicycle except as freight. A bicycle is no more baggage than is any other vehicle. Moreover, the bicycle in the present case was not properly packed.

Press despatches from Kansas, and also from Illinois, state that the railroads are seizing coal from cars in transit, for use in their locomotives.

The officers of the Canadian Pacific have settled the differences which led to the strike of shopmen west of Winnipeg.

A New York Central Improvement.

The New York Central & Hudson River RR. is building at Ravena, N. Y., an 18-stall brick roundhouse, 80 ft. deep, with boiler house 24 x 45 ft., a shop 21 x 45 ft., storehouse 43 x 12 ft., and turntable 65 ft. 8 in. in diameter, at an estimated cost of $40,000. A general contract has been let to Wm. J. Gillette, of Syracuse. New coal pockets and a trestle about 700 ft. long were recently built. Eighteen miles of additional tracks will be laid for a new yard.

The Illinois and Mississippi Canal.

Major Wm. L. Marshall, Corps of Engineers, U. S. A., will receive proposals Nov. 13 for building 12 miles, more or less, of the Illinois and Mississippi Canal. Information can also be had from Assistant Engineer L. L. Wheeler, Sterling, Ill.

An Enterprising Journal.

We have received from certain locomotive builders a copy of a manuscript entitled "A Careful Comparison of Locomotives," which has been sent out for approval by a newspaper which we may call the Alaska Commercial Record. The publishers of that journal say that there is a great development in the territory in which it circulates and that "it has received several letters from subscribers who contemplate the building of private lines, asking us where the best locomotives could be purchased." The kind-hearted and public-spirited editor has made careful investigation and secured the opinions of the most skillful engineers and noted the common objections to various types of engines. He finds that the engines made by the ——— Company "stand pre-eminently ahead of those produced on either continent." He finds that an introduction of a few of the engines made by this company on any railroad has almost invariably resulted in additional orders. He then protests as to his own virtue and concludes with the statement that "an unreliable or purchased endorsement has never appeared upon our pages." A letter accompanying this manuscript says that the article will be published as an editorial and without charge, and that while the price of the "Record" is 15 cents a copy it can be furnished in 1,000 lots at 8 cents. Furthermore, an order for 100 copies carries with it a year's subscription.

Train Robbery Near Chicago.

Press dispatches of Oct. 14 report that westbound passenger train No. 3 of the Chicago & Northwestern was stopped by robbers at signal tower W, near Maple Park, 50 miles west of Chicago, on Friday night, and the express car robbed of the contents of the safe, said to have been $25,000. The robbers bound and gagged the signalman and destroyed his telegraph apparatus. They then stopped the train with the semaphore. The trainmen made some resistance, but the robbers soon got into the express car and blew open the safe. Some of the paper money was destroyed by the explosion. After the robbery the bandits took the engine and went forward about two miles, and then decamped. There were three of them.

Chicago Sewer Contracts.

Mayor Harrison last week decided to reject all the bids received for the intercepting sewer from Thirty-ninth to Seventy-fifth St. and will ask the City Council for permission to build the sewer by day labor. The contract was divided into two sections, the lowest bid for the total work being $853,654.79. The bids, which were received last Summer, were as follows:

	Sec. G.	Sec. H.
Patrick A. Nash	$531,556.95	$322,097.84
Nash & Dowdie	532,724.00	336,020.20
Thomas Burke	542,744.35	.....
Gahan & Byrne	556,005.20	.....
Byrne & Shortall	.....	343,932.24
Dennis Cleary	.....	355,482.72

The Sault Canals.

The following ships and tonnage passed through the canals at Sault Ste. Marie, Michigan and Ontario, in the month of September, 1899:

East bound freight, net tons		2,729,952
West bound freight, net tons		535,724
Total freight, net tons		3,265,676
Total craft through United States Canal	2,286	
Total craft through Canadian Canal	402	
		2,688
Total registered tonnage through U. S. Canal	2,574,545	
Total registered tonnage through Can. Canal	326,443	
		2,900,988

New East River Bridge.

Work is being rapidly pushed on the New East River bridge. The anchorages on both sides have been nearly completed, and work on the steel towers will at once be undertaken. The two steel towers and the end spans will require about 12,000 tons of steel. On the Brooklyn side the foundations have been entirely completed; the contract for this work was let June 30, 1897. The two piers on the New York side have also been completed. This work was begun in September, 1896. The two steel towers, it may be remembered, will each be made up of eight columns properly braced. At about the floor level they will be provided with a system of girders to support the ends of the end span as well as the ends of the suspended structure of the main span

of the bridge. At the top of the towers there will also be a system of girders on which will rest the saddles with their friction rollers complete and ready to receive the cables. A steel pier, known as the intermediate pier, will be placed between the tower and the anchorage on each side of the river. For detailed drawings and extracts from the specifications see Railroad Gazette, Feb. 11, 1898.

Dismal Swamp Canal.

The Dismal Swamp canal was formally opened to navigation October 14, and a procession of vessels went through, the United States torpedo-boat Talbot bringing up the rear.

Nearly a million dollars was spent in reconstructing the canal to meet the demands of modern traffic and to furnish an island waterway from the Chesapeake Bay to Albemarle and Pamlico Sounds.

Burning of the Steamer Nutmeg State.

The steamboat Nutmeg State, of the Bridgeport Line, was destroyed by fire about 5 o'clock on the morning of Oct. 14, on Long Island Sound near North Hempstead, Long Island, N. Y., while on her regular trip to New York City. The passengers were taken off as soon as possible and the boat was beached, but six or more of the crew and two or more passengers were either drowned or burned to death. Dozens of people in the water were rescued by the steamer City of Lawrence and by small boats which put out from the shore.

New York Public Works.

The Mayor on Oct. 10 signed the resolution of the Board of Estimate and the Municipal Assembly appropriating $2,000,000 for repaving of streets in the five boroughs. This makes the appropriation available for use, but no work will be begun until next spring. Commissioner Keating has not yet determined what streets will be improved. With the $2,000,000 which he has asked from the Board of Estimate for 1900, he will have nearly $5,000,000 for repaving.

The City Comptroller has withdrawn the offer to sell bonds of the city amounting to $9,087,107.32 on Oct. 18.

Instead of the original offer, the Comptroller announces that $2,877,107.32 of these bonds will be sold on Oct. 26. This amount is needed to replenish the street and park opening fund, to improve Park Ave. above 106th St. and to pay the award to the Long Island Water Co.

The postponed issues cover the following works: A new Hall of Records, $1,950,000; for the uses and purposes of the Department of Docks and Ferries, $1,000,000; for the sanitary protection of the sources of the water supply, $400,000; for acquiring lands for a public park bounded by 145th and 155th Sts. and Edgecombe and Bradhurst Aves., $1,360,000; for the new aqueduct, $1,500,000.

Deep Waterway Convention in Illinois.

On October 10-11 a convention was held at Peoria, Ill., for the purpose of taking action toward securing the assistance of the Federal Government in the construction of a deep waterway between Lake Michigan and the Mississippi River and Gulf of Mexico. About 300 delegates, appointed by county judges from counties bordering on the river, and from St. Louis, were present. Senator S. M. Cullom and several of the Illinois Congressmen were also present. Abopt 50 delegates from Chicago representing the city, Cook County, and the Chicago Sanitary District, attended, among them being Messrs. Onward Bates, H. B. Herr, L. E. Cooley, Ossian Guthrie, J. S. Dunham, Judge O. N. Carter, O. W. Meysenberg, and five of the Trustees of the Chicago Sanitary District. The Convention adopted the following resolutions as its platform before adjourning:

1. That we reaffirm and approve the action of the convention held in Peoria in October, 1887, in favor of a deep water way and general legislative acts in harmony therewith.
2. That the advanced stage of the work on the sanitary and ship canal of Chicago justifies the immediate co-operation of Congress with a view to the early completion of the water ways between the Lakes and the Mississippi.
3. That we urge the supreme utility of this water way and that the large flow of water from Lake Michigan is necessary to its adequate development.
4. That we renew and emphasize the request repeatedly made by various bodies of our citizens and by the General Assembly of the State for the early removal of the Federal dams in the lower Illinois River; provided, that such work shall be carried out with due regard to the maintainance of existing navigation.
5. We hereby petition and request our Senators and Representatives in Congress to use their best efforts to secure such appropriations and provide such Board of Engineers as may be deemed essential for the purpose of making surveys and examinations from Lake Michigan to the Mississippi River, prepare plans and estimates, and execute the work of improvement named in these resolutions.
6. Be it further resolved, that the great importance of the Mississippi River as a commercial highway, the vast extent of the interests dependent upon it and affected by it, and its influence on the general prosperity of the entire country are all such as to deserve the most liberal treatment at the hands of the general Government, to the end that its improvement may be made so complete that it will furnish at all times an unobstructed outlet to the sea for the surplus products of the Mississippi Valley.

A permanent Executive Committee of 32, of which Col. Isaac Taylor was made Chairman, was appointed to take charge of the work and given power to begin a campaign and push it to a conclusion. The Committee agreed to meet in Springfield, Ill., within three weeks, to lay out its work. The Committee consists of Messrs. H. R. Whitmore, W. P. Kennett, James A. Ockerson and Chris. Sharp, of St. Louis; Judge Carter, L. E. Cooley, Thomas Gahan, William Boldenweck, Frank Wenter, Joseph Downey and H. B. Herr, of Chicago, and one or two representatives each from 18 towns and counties in Illinois. This Committee was instructed to call a convention from all States lying along and directly interested in the proposed waterway, for the purpose of getting Gongressional delegations from such States to work for a Congressional appropriation.

LOCOMOTIVE BUILDING.

It is reported that the Columbus, Wellston & Southern will buy two locomotives.

The Baldwin Locomotive Works are building two engines for the Vera Cruz & Pacific.

The Florence & Cripple Creek is having two engines built by the Schenectady Locomotive Works.

The Iowa Central is reported to have ordered six compound consolidation locomotives from the Baldwin Locomotive Works.

The Davenport, Rock Island & Northern has ordered from eight to 10 locomotives from the Schenectady Locomotive Works.

The order for locomotives given by the Atchison, Topeka & Santa Fe to the Baldwin Locomotive Works calls for 55 instead of 50, as stated last week.

It is understood that the Atchison, Topeka & Santa Fe will build 12 more consolidation locomotives at its Topeka shops, similar to those recently finished there.

The Chicago, Burlington & Quincy has ordered 20 mogul freight engines from the Richmond Locomotive & Machine Works. They will have 19 in. x 26 in. cylinders and 64 in. driving wheels.

It is understood that the Denver & Rio Grande is considering ordering about 20 locomotives, and that specifications are being prepared, but we are officially informed that the road is not yet in the market.

Press dispatches state that the Baldwin Locomotive Works have received an order to build 20 mogul locomotives for the Great Central, of England. We are informed that this is not new, being simply a revival of the reports of an order placed last May.

The New York, New Haven & Hartford has placed an order with the Schenectady Locomotive Works for 40 engines. Five will be eight-wheel passenger, with 20 in. x 26 in. cylinders and 78 in. driving wheels; 25 mogul freight, with 20 in. x 28 in. cylinders, duplicates of similar engines furnished the road last year; and 10 six-coupled compound "noiseless" switching locomotives for service in New York City.

The Canadian Pacific has ordered from the Richmond Locomotive & Machine Works 12 compound consolidation engines for May, 1900, delivery. They will weigh 150,000 lbs. with 133,000 lbs. on the driving wheels, and have 21 in. and 33 in. x 26 in. cylinders; 57 in. driving wheels; Belpaire boilers with 255 tubes 2 in. in diam. and 12 ft. 11⅛ in. long and a working steam pressure of 200 lbs.; fireboxes, 9 ft. 1⅞ in. long and 3 ft. 6⅝ in. wide, of steel, and a tank capacity for 4,000 gals. of water.

The 16 compound 10-wheel engines ordered by the Chicago, Rock Island & Pacific from the Baldwin Locomotive Works, as stated last week, are for April, 1900, delivery, and will weigh about 165,000 lbs. The boilers will be of the extended wagon top type, 68 in. in diam., with a working steam pressure of 200 lbs., and the engines will have a tender capacity for 5,500 gals. of water and 10 tons of coal. Jerome metallic packing, Westinghouse brakes, Simplex injectors, Nathan lubricators, Ashton safety valves, Scott Springs, and Williams headlights are specified.

CAR BUILDING.

The Southern Pacific is in the market for 1,000 box cars.

The Lehigh Valley is receiving bids on 3,000 to 4,000 box cars.

The Pennsylvania has asked bids on 3,500 freight cars of different classes.

The Chicago & Alton is considering placing orders for 1,000 coal and some stock cars.

The Chicago, Milwaukee & St. Paul will get bids on 40 coaches and six sleeping cars.

It is reported that the Mobile & Ohio will order 1,000 freight cars. We have nothing official.

Pullman's Palace Car Co. has received an order for 1,500 box cars for the Baltimore & Ohio System.

The Mount Vernon Car Mfg. Co. has an order to build 211 freight cars for the Choctaw, Oklahoma & Gulf.

The Pittsburgh, Shawmut & Northern has ordered three cars for passenger service from the Jackson & Sharp Co.

It is reported that the Northern Pacific is in the market for 2,000 box cars. We have no official information.

The Davenport, Rock Island & Northern has placed an order with Barney & Smith Car Co. for 16 passenger cars.

The Brainerd & Northern Minnesota has ordered 25 flat cars, of 80,000 lbs. capacity, from the Mt. Ver-Vernon Car. Mfg. Co.

The Cleveland, Lorain & Wheeling has ordered 500 more coal cars, of 80,000 lbs. capacity, from Pullman's Palace Car Co.

The Philadelphia & Reading has ordered 200 hopper-bottom gondolar cars, of 60,000 lbs. capacity, from the Lebanon Mfg. Co.

The New York, New Haven & Hartford has ordered 500 coal cars from the American Car & Foundry Co., to be built at Buffalo.

The Grank Trunk is said to have ordered ten coaches in addition to the ten it is building at its own shops, as noted Sept. 29.

The order placed by the Chicago & Northwestern with Pullman's Palace Car Co., as noted Sept. 29, is for 45 cars for passenger service.

We are officially informed that the Duluth, South Shore & Atlantic does not intend to buy any steel cars, as recently reported by a railroad paper.

The Minneapolis, St. Paul & Sault Ste. Marie has ordered 40 refrigerator cars from the Wells & French Co. and will receive bids Oct. 25 on 1,000 box cars.

The New York Central & Hudson River is receiving bids on 10,000 box cars to be built from modified specifications, and it is reported that orders will be placed this week.

The Erie has obtained from the American Car & Foundry Co. an option on 1,000 coal cars, but the number will probably be increased to 2,000 when the order is given. The road is also preparing to order 2,000 box cars.

The Texas Midland has ordered 100 box cars from the American Car & Foundry Co., to be built at its St. Charles Works. They will be 40 ft. long, and the special equipment will include Westinghouse air brakes, Sterlingworth brake beams, Flateau roofs, and Missouri car doors.

The 1,000 box and 500 low-side gondola cars recently ordered by the Central of New Jersey from Haskell & Barker, as noted October 6, are for delivery early in 1900. The box cars will be 35 ft. long, 9 ft. 9¼ in. wide over all, and 12 ft. 2⅛ in. high. The gondola cars will be 36 ft. long, 9 ft. 11 in. wide over all, and 6 ft. 1½ in. high from the rails.

The Laclede Car Co. has, it is stated, received an order for 120 freight cars for the Havana (Cuba) Electric RR.

The Boston Elevated will shortly place orders for 300 new cars for use on its elevated structure, and it is stated that the orders will be divided between Osgood Bradley & Sons and the Wason Car Mfg. Co.

BRIDGE BUILDING.

ATLANTA, GA.—See "Other Structures."

BLOOMSBURG, PA.—Viewers have been appointed for a county bridge in Briarcreek.

Viewers have recommended a county bridge over Little Fishing Creek, on the line of Greenwood and Fishing Creek townships.

A new county bridge over Roaring Creek has been approved by the Grand Jury.

A favorable report has been made for county bridges over Raven Creek, in Benton Township, and also over Deerlick Run, in Mt. Pleasant Township. Chas. M. Terwilliger, Clerk Columbia County.

BOSTON, MASS.—The Toledo Bridge Co. has the contracts for both the Boston St. and Dorchester Ave. steel bridges at $9,935 and $13,475. There were five other bids.

BROOKHAVEN, MISS.—For a third time the contract for a bridge across the Homochitto River has been let, this time to E. P. Alsbury & Son, of Houston, Tex., for $7,750. Both the New Jersey Steel & Iron Co. and the Indiana Bridge Co. forfeited their bonds.

CEDAR BLUFF, ALA.—The County Commissioners of Cherokee County are negotiating with the Converse Bridge Co., of Chattanooga, Tenn., for a steel bridge across the Coosa River.

CARROLLTON, KY.—The War Department has granted permission for the bridge over the Kentucky River to be built by the Carrollton Electric Ry. & Bridge Co. It will be 81 ft. high. The city of Carrollton, at the next election, will consider issuing $6,000 of bonds toward the assistance of building this bridge to Prestonville. R. L. Vallandingham, Mayor.

CARTHAGE, TENN.—The County Court of Smith County has authorized a bridge across the Cumberland River to cost about $60,000. The structure will be about 1,000 ft. long. L. A. Ligon is Chairman of the Committee. (Aug. 11, p. 572.)

CENTER, ALA.—The Cherokee County Commissioners have decided to build a steel bridge across the Coosa River near Center.

CENTRAL CITY, NEB.—Bids are wanted, according to report, by the County Clerk for a bridge across Wood River.

CHARLOTTETOWN, P. E. I.—The Prince Edward Island RR. is preparing to build a bridge across Hillsborough River for a proposed extension.

CINCINNATI, O.—The Hamilton County Commissioners will issue $10,000 of bonds to build the proposed bridge on Paddock Road.

CLEVELAND, O.—Proposals will be received until Nov. 10 by Chas. P. Salem, City Auditor, for $100,000 of 4 per cent. bridge bonds.

COLUMBUS, GA.—It is reported that a new bridge will be built by the city. M. M. Moore, City Clerk.

COLUMBUS, O.—Reports state that a steel bridge to cost between $35,000 and $50,000 will be built over the Oleantangy River at Goodale St.

COLUMBUS, Tex.—At the elections held Sept. 26 an issue of $30,000 of new bonds for bridges was authorized. D. W. Jackson, Weimar, Tex., may be addressed.

COTULLA, TEX.—The State Board of Education has bought the $5,000 of La Salle County bridge bonds for new work.

DAGSBORO, DEL.—A bridge is in consideration across Vine Creek, in Sussex County. There is no telling when bids will be wanted. The last Legislature authorized this structure.

DEERFIELD, MASS.—The County Commissioners are considering altering the Consolidated railroad bridge in Wapping.

DENISON, TEX.—The Missouri, Kansas & Texas Ry.'s viaduct in Denison will probably be rebuilt.

DETROIT, MICH.—A special election was held in Springwells Oct. 12 to vote upon the proposition to bond the township for $14,000 for a proposed bridge at Fort St., across the River Rogue. Ecorse Township has voted to pay for part of the cost of the structure.

DONALDSONVILLE, LA.—At the Town Council meeting Oct. 11, the Bridge Committee reported a contract by which the Donaldsonville Bridge Co. will repair the Bayou bridge so as to turn it over to the town and parish in good order on Jan. 10, 1900.

HOQUIAM, WASH.—The City Council on Oct. 5 granted an electric railroad franchise which carries a provision for a bridge across the Hoquiam River at Eighth St.

HUNTINGTON, IND.—Bids are wanted Oct. 27 for a bridge as follows: Across Rabbit Run, in Huntington; across Little River, in Jackson; across Pond Creek, in Jefferson, and one on the Maple Grove gravel road. W. F. Swain, Auditor of Board of County Commissioners.

HOUSTON, TEX.—A new bridge has been recommended for the present San Jacinto St. bridge, which is beyond repair. Waddell & Hedrick of Kansas City, Mo., made the examination of the old structure.

JERSEY CITY, N. J.—It is stated that bids will be wanted on new plans and specifications for the bridge over the Pennsylvania RR. at Baldwin Ave. for which F. R. Long & Co., of New York, failed to carry out the contract which they were awarded several months ago.

The joint Bridge Committee of the Hudson and Essex County Board of Freeholders is considering

rebuilding the Paterson Plank Road bridge over the Passaic River. The present bridge is of wood.

JOHNSON CITY, TENN.—The Ohio River & Charleston Ry. Co. will have two bridges, one 480 ft. long and one 240 ft. long. The company is now putting in several wooden Howe trusses with masonry piers, and spans 120 ft. long. A. N. Molesworth, Chief Engineer and Superintendent.

LANCASTER, PA.—The viewers appointed for a bridge across the Cocalico at Bowman's farm have reported favorably. The bridge will be about 140 ft. long.

LYONS, IA.—Reports state that bids will probably soon be wanted for a new arch bridge at Sixth St. and Third Ave., Lyons. Address G. D. McDaid, Mayor; W. E. Russell, City Clerk, Clinton.

MASSILLON, O.—The Wheeling & Lake Erie RR., according to report, will rebuild the trestle over the Tuscarawas River south of Tremont St., with a new bridge of the same kind. A. S. Bretherton, Engineer, Toledo.

M'KEESPORT, PA.—The Council has appointed a committee to confer with the McKeesport, Duquesne & Wilmerding Ry. in regard to a steel bridge on Versailles Ave. at White's Hollow.

MEISERVILLE, PA.—The Grand Jury has approved of the proposed bridge across the Mahontonga River at Meiserville, Snyder County. The proposed bridge across the river at Port Treverton is disapproved.

MILWAUKEE, WIS.—The Common Council on Oct. 11 passed two bond ordinances. One of $60,000 is for a new district school in the Eighteenth Ward at Linwood and Bartlett Sts. The other ordinance is for $80,000 for the proposed new bridge at Broadway and to remove the old structure to Lincoln Ave. The new structure at Broadway will probably be a Bascule bridge. (Aug. 4, p. 558.)

MINNEAPOLIS, MINN.—The City Engineer has recommended that $70,000 be spent next year for improvements to bridges.

MORRIS, ILL.—A steel bridge, according to report, will be built over the Illinois River to replace the wooden structure which has been condemned.

NATCHEZ, MISS.—Adams County has sold $5,500 of 5 per cent. bonds for new bridges. John F. Jenkins, Clerk Board of Supervisors. (Sept. 22, p. 665.)

NEW HAVEN, CONN.—The War Department has ordered that the bridge across the West River, between the town of Orange and Kimberly Ave., New Haven, Conn., be a drawbridge and be finished within one year. This structure has been in consideration for several years. C. W. Kelly, City Engineer.

NEW YORK, N. Y.—Chief Engineer Probasco of the Bridge Department has completed the details of the plans for the new Blackwell's Island bridge, to be built between Ravenswood, Lond Island City, and Manhattan. They have been approved by Bridge Commissioner John L. Shea. The new bridge will be 150 ft. wide and 2,710 ft. long between the shore lines.

According to the figures, the estimated cost of the bridge will be as follows:

Condemnation of land in Manhattan	$1,485,000
Condemnation of land in Queens Borough	573,000
Main bridge	1,392,000
Approach in Manhattan	930,000
Approach in Queens Borough	1,360,000
Total	$5,740,000

OMAHA, NEB.—The Union Pacific and the C., B. & Q. railroads, according to report, have been requested by the Park Commissioners to build a 500-ft. viaduct across Central Boulevard.

OSBORNE, KAN.—Albert P. Dwyea, County Surveyor, writes us that the County Commissioners will receive bids until Oct. 21 for steel bridges over Twin Creek, Twelve-Mile Creek and East Wolf Creek. They will be single span, one of 70 ft. and two of 60 ft.

OTTAWA, O.—On Oct. 23, at 12 M., Putnam County will sell $10,000 4½ per cent. bridge bonds. J. C. Jones, County Auditor.

OTTAWA, ONT.—The building of the Somerset St. bridge here will not be undertaken for some time. It will be a highway bridge crossing a navigable canal, with a railroad allowance on each side of the canal.

PATERSON, N. J.—The Park Commissioners propose to build a foot bridge across the Passaic River from the Little Falls Road to Westside Park. The County Freeholders have prepared plans for this structure.

PHILADELPHIA, PA.—The Department of Public Works will receive proposals until Oct. 24, at 12 o'clock noon, for building a bridge on the line of Grant St., over a branch of Penny Pack Creek; also for a new bridge over the Philadelphia & Reading at or near East St., in the Twenty-first Ward. Bids are also wanted for painting bridges. William C. Haddock, Director.

The Highway Bureau's estimate for work for 1900 includes $150,000 for general repairs to bridges, which is an increase of $90,000 over the appropriation of 1899.

PITTSBURGH, PA.—One of the bridges to be built from the recent bond issue will be over Junction Hollow at Wilmot. (Sept. 29, p. 683.)

Arrangements have been made for a $50,000 steel bridge across Second Ave. between Greenfield and Sylvan Aves. to avoid the grade crossing at Laughlin Junction, now used as a connection for the Baltimore & Ohio, Monongahela Connection and Pittsburgh Junction railroads.

The Supreme Court has ordered that the Ft. Pitt Passenger RR. Co., which is a part of the Consolidated Traction Co., build either a bridge or an underground crossing at 33d St., where it crosses the Pittsburgh Junction RR. at grade.

RIPPLEMEAD, VA.—The Virginia Bridge & Iron Co. has the contract for the new iron bridge over the New River at Ripplemead, at $17,868. (Pulaski City, Aug. 25, p. 601.)

SMETHPORT, PA.—The Grand Jury has recommended a bridge over the Allegheny River in Annin Township.

Viewers have been appointed for a proposed bridge over Oswayo Creek, in Ceres Township.

Viewers have also been appointed on a petition for a bridge over Kinzua Creek, on the road to Lafayette. C. M. Colegrove, Surveyor.

TOLEDO, O.—A bridge across Mud Creek is said to be under consideration.

TURNERS FALLS, MASS.—The County Commissioners contemplate rebuilding the bridge over the Consolidated railroad tracks in Turners Falls. The present structure is too narrow.

VICKSBURG, MISS.—The Board of Supervisors of Warren County has authorized the issue of $4,200 bonds for bridge purposes.

WARESBORO, GA.—A bridge about 500 ft. long will be built across Cox Creek, in the town of Waresboro.

WAYCROSS, GA.—A bridge will be built across Kettle Creek, three miles from Waycross. It will be 500 ft. long and will be paid for by Ware County.

WELLSBORO, PA.—The Grand Jury has recommended three new bridges in Tiaga County. One is in Jackson.

YORK, PA.—The Pennsylvania RR. will rebuild the bridge across Corduras Creek, between Philadelphia and Beaver Sts., known as the short line bridge.

Other Structures.

ATLANTA, GA.—Plans are being prepared for the new Carnegie Library building in Atlanta. The structure will cost over $100,000.

Four plans have been submitted to the Railroad Commissioners by the interested railroads for the proposed union depot in Atlanta. The cost of this structure is placed between $500,000 and $650,000. A new viaduct over Whitehall St. is provided for in the various plans.

ALLENTOWN, PA.—Architects Jacoby & Weishampel, of Allentown, have plans in preparation for a large silk mill, to be built in Allentown. It will be brick and iron, measuring 50 x 160 ft., one story and basement, with an additional boiler and engine house building, measuring 40 x 60 ft.

BOSTON, MASS.—William M. Wood, Treasurer of the American Woolen Co., is reported as saying that the company will build new mills at Concord Junction. One of the mills will be 1,500 ft. long. A large wool storehouse will be built.

BROOKLYN, N. Y.—The St. Mark's P. E. Church will build a new building at Brooklyn Ave. and Eastern Parkway, to cost $150,000. The church will have a frontage of 150 ft. on the Parkway and will be 220 ft. 7 in. on Brooklyn Ave. Mr. Henry M. Congdon, 18 Broadway, New York City, is the architect.

BRISTOL, VA.—The Columbian Paper Co., of Philadelphia, Pa., will, according to report, build a $400,000 pulp mill at Bristol.

BUFFALO, N. Y.—The East Buffalo transfer house of the Lehigh Valley RR., on Dingens St., was destroyed by fire Oct. 14.

CHICAGO, ILL.—The Western Electric Co. has been granted a permit to build a two-story foundry 50 x 170 ft. at 266 to 274 S. Jefferson St., at a cost of $25,000. S. A. Treat is the architect. Permits were also issued for the additions to its plant noted in our issue of Oct. 13, p. 717.

Contracts have been let for an annex to the warehouse of H. Bucklen & Co., Michigan Ave. and Peck Court. It will be 40 x 60 ft., six stories high, with steel frame and pressed brick and stone exterior, and will cost $30,000.

Plans have been prepared by Mr. E. A. Mayo, architect, for a hotel which F. W. Cushing is considering building at Highland Park, north of Chicago, on Lake Michigan. The plans provide for a three-story central building of pressed brick about 250 x 45 ft., with wings about 40 x 70 ft., the building to have 125 rooms and to cost $100,000.

W. F. Grower will build an eight-story warehouse and manufacturing building at the southeast corner of Desplaines St. and Jackson Boulevard. It will be irregular in shape, fronting 71 ft. on Jackson Boulevard, running 100 ft. back to the Metropolitan Elevated Ry. and 150 ft. west to Desplaines St., on which it will front 50 ft. It will be of mill construction, with exterior of pressed brick and stone trimmings. F. B. Abbott is the architect.

A. Gottlieb is intending to build a six-story building at Nos. 117-121 West Randolph St. for wholesale grocery purposes. It is to cost about $40,000, and will have a street frontage of 55 ft. and a depth of 90 ft.

A roundhouse is to be built by the Lake Shore RR. at the southwest corner of Mackinaw and 86th Sts. It is to cover 172 x 75 ft. of ground and is to cost $6,000.

The Scully Steel & Iron Co., 130-148 Fulton St., Chicago, propose to build a five-story fire-proof building on property recently bought and adjoining their present plant. A one-story building of corrugated iron for storage purposes will be built for the present.

DES MOINES, IA.—Arrangements have been made to rebuild the large department store on the corner of Walnut and Seventh Sts., occupied by Harris Emery Co., which was destroyed by fire recently. The new structure will have a frontage of 66 ft. on Walnut St. and 132 ft. on Seventh St. It will be six stories in height, one story higher than the old building. Estimated cost, $125,000.

EAST ST. LOUIS, ILL.—It is stated that the various railroads entering East St. Louis have notified the State Railroad & Warehouse Commission that plans have been agreed upon for the proposed new relay depot in East St. Louis, and that a site has been decided upon. (July 14, p. 513.)

HACKENSACK, N. J.—The New York, Susquehanna & Western, controlled by the Erie, will build a new station at Hackensack. The dimensions of the proposed new station are not yet determined.

HASTINGS, N. Y.—Fire in the plant of the National Conduit & Cable Works on Oct. 13 did $150,000 damage.

HAYWARD, WIS.—A new Indian school will be built at this place to cost about $60,000.

HUNTSVILLE, ALA.—Reports state that arrangements have been made to build an extension to the Dallas Mill which will double the capacity.

HOBOKEN, N. J.—The plans for the new engineering laboratory for the Stevens Institute of Technology have been decided upon. The structure will cost $50,000.

JEROME, ARIZ.—It is stated that J. H. Perkins has made plans for a new office building for the United Verde Copper Co., which will cost about $20,000. This company has other work in consideration. H. J. Allen, General Manager.

JERSEY CITY, N. J.—A new high school building will be built in Jersey City, for which $300,000 of bonds will be sold.

LOS ANGELES, CAL.—Bonds to the extent of $200,000 will be sold on Oct. 23 for new school buildings. C. H. Hance, City Clerk.

LUDINGTON, MICH.—Bonds to the extent of $100,000 for water works were sold Oct. 17. James C. Mustard, City Clerk.

MADISON, WIS.—The Gisholt Machine Co. will build a new brick and steel foundry 100 x 175 ft.

MEMPHIS, TENN.—The Frank G. Jones Shoe Co. will build a shoe factory in Memphis.

MEXICO CITY, MEXICO.—The National Bank of Mexico, said to have a capital and surplus of $20,000,000, is about to build a new building. It will have a steel frame, with stone facings.

MILWAUKEE, WIS.—See Bridge Building.

MINEOLA, N. Y.—Plans have been submitted to the Nassau County Supervisors for the new Nassau County Court House.

MORGANTOWN, W. VA.—Wilson Bros. & Co., Philadelphia, Pa., architects for the West Virginia University, are receiving proposals for the new buildings. The mechanical hall, which is the main building, will be three stories high, 168 x 44 ft. In the rear there will be a power plant 144 x 76 ft. An armory will also be built 133.1 x 88.5 ft. and a library three stories high 134.7 x 105.1 ft.

NEW BRUNSWICK, N. J.—The Raritan River RR. according to report will build a new passenger station in New Brunswick. The Pennsylvania RR. will also build a new station when its tracks are elevated in this city.

NEW YORK, N. Y.—Wm. Prescott will build an eight-story loft and store building at 22 E. 36th St., to cost about $70,000. Mr. G. W. Spitzer is the architect.

An eight-story building will be built by R. P. Riterbusch at 124 Bleecker St., to cost about $75,000.

The Central Brewing Co. will build a three-story stable at 338 W. 68th St., to cost $40,000. The Willis Grieser Construction Co. are the architects.

A six-story storage house will be built at 542 Sixth St., after the plans of Messrs. Kurtzer & Rohl, by Adam Steubling, estimated to cost $11,000.

Plans for Senator T. D. Sullivan's new music hall at 112 W. 34th St. and 109-111 W. 33d St., were submitted to the Building Department Oct. 17 by Architect M. Bernstein. The cost is estimated at $53,000.

PADUCAH, KY.—Chas. Read, Vice-President of the Palmer Hotel Co., tells us that the hotel company has bought property adjoining the present hotel for the purpose of building an annex and opera house, but that nothing will be done until next year. The new work will probably cost about $75,000.

The Illinois Central, according to report, is contemplating building a new depot in this place.

PEEKSKILL, N. Y.—A Catholic church will be built in Mohegan, on the site given by Frank Frye, of the St. Nicholas Hotel, Lake Mohegan.

PHILADELPHIA, PA.—Foster Bros., of Manayonk, are having plans made for a three-story brick and iron factory on Main St., near Levering.

Benjamin H. Barton, 416 Walnut St., has plans and specifications for a brick and iron framed factory building at 22d St. and Allegheny Ave. It will be 25 x 165 ft., two stories and basement, and will have cement and wooden flooring, ventilating apparatus, steam heating and fittings, piping, electric work, etc.

Philip H. Johnson is making plans and specifications for a modern apartment house. It will be steel skeleton, with fancy brick, stone and terra cotta front. It is to be about eight stories and basement.

Spencer Roberts, architect, is working on plans for a brick and iron factory building.

The J. G. Brill Car Co., of West Philadelphia, intend building a large addition to their plant to be used for machinery and foundry purposes. Estimates are being received by Macey-Henderson & Co., Heed Building, Philadelphia, and call for a brick and iron structure, with slag roofing, electric wiring, piping and drainage, glazing, painting, hardware, etc. Plans are private.

PITTSBURGH, KAN.—An issue of $35,000 of bonds for a city hall have been sold.

PITTSBURGH, PA.—The Carnegie Steel Co., Ltd., will soon let a contract for a new office for the Paymaster of the Homestead Steel Works, which is estimated to cost $12,000. It will be opposite the present general office in Homestead.

The Standard Underground Cable Co., reports state, will enlage its plant at this place.

We are told by Messrs. D. H. Burnham & Co., the architects for the new passenger station for the Pennsylvania System in Pittsburgh, that the contract for the work has not yet been awarded.

The nut and bolt factory of the Marland, Neely & Co., South Side, Pittsburgh, was destroyed by fire Oct. 8.

Plans for the new Pittsburgh & Lake Erie RR. station have been turned down by the Building Department. The proposed station will front 132 ft. on Smithfield St., and will be 49 ft. deep.

PRATT CITY, ALA.—Last Sunday the Kansas City, Memphis & Birmingham RR. depot at Pratt City was entirely destroyed by fire.

PRINCETON, N. J.—A new building, to be known as Dodge Hall, will be built for Princeton University at a cost of about $60,000.

RANKIN, PA.—The Pittsburgh Steel Shafting Co., recently incorporated with a capital of $100,000, is

building a plant at Rankin. The main building is a two-story structure, 170 x 60 ft. Thomas W. Fitch, Jr., is interested.

ST. LOUIS, MO.—The Monarch Rubber Co. will build a two-story rubber factory and boiler rooms on Bittner St., which will be 236 x 156 ft. and cost about $40,000.

SANDY HILL, N. Y.—The Union Bag & Paper Co., reports state, will build a new factory at Sandy Hill.

WASHINGTON, D. C.—Bids are wanted until Oct. 28 for a pump and boiler house at the naval station, Puget Sound, Wash. Address Mordecai T. Endicott, Chairman of the Bureau of Yards & Docks, Navy Department.

WESTFIELD, MASS.—The Wm. Warren Thread Co. will build an addition to the plant. F. L. Worthy, Treasurer and Manager.

MEETINGS AND ANNOUNCEMENTS.

Dividends.

Chicago, Milwaukee & St. Paul.—Common 2½ per cent; preferred 3½ per cent., payable Oct. 21.

Cincinnati, Hamilton & Dayton.—Quarterly, new preferred, 1¼ per cent., payable Nov. 8.

Cincinnati, Sandusky & Cleveland.—Semi-annual, preferred 3 per cent., payable Nov. 1.

Northern Pacific.—Quarterly, preferred, 1 per cent., payable Dec. 5.

Consolidated Traction (Pitts.).—Semi-annual, 3 per cent., payable Nov. 15.

Meetings and conventions of railroad associations and technical societies will be held as follows:

American Society of Civil Engineers.—Meets at the house of the Society, 220 W. 57th St., New York City, on the first and third Wednesdays in each month, at 8 p. m. C. W. Hunt, Secretary, 220 W. 57th St., N. Y. City.

American Society of Mechanical Engineers.—Meets at 12 W. 31st St., New York City, on the first Tuesday of each month from October to June, except December. F. R. Hutton, Secretary. The date set for the approaching convention is Dec. 5 to 8, 1899.

Association of Engineers of Virginia.—Holds its formal meetings on the third Wednesday of each month from September to May, inclusive, at 710 Terry Building, Roanoke, at 5 p. m.

Boston Society of Civil Engineers.—Meets at 715 Tremont Temple, Boston, on the third Wednesday in each month, at 7.30 p. m. S. E. Tinkham, Secretary, City Hall, Boston.

Canadian Society of Civil Engineers.—Meets at its rooms, 112 Mansfield St., Montreal, P. Q., every alternate Thursday at 8 p. m.

Central Railway Club.—Meets at the Hotel Iroquois, Buffalo, N. Y., on the second Friday of January, March, May, September and November, at 10 a. m. Harry D. Vought, Secretary, 114 Fifth Ave., N. Y. City.

Chicago Electrical Association.—Meets at Room 1737, Monadnock Building, Chicago, on the first and third Fridays of each month at 8 p. m. Cloyd Marshall, Secretary, Monon Bldg., Chicago.

Civil Engineers' Club of Cleveland.—Meets in the Case Library Building, Cleveland, O., on the second Tuesday in each month at 8 p. m. Semi-monthly meetings are held on the fourth Tuesday of each month. Arthur A. Skeels, Secretary.

Civil Engineers' Society of St. Paul.—Meets on the first Monday of each month except June, July, August and September.

Denver Society of Civil Engineers.—Meets at 36 Jacobson Bldg., Denver, Colo., on the second Tuesday of each month except June, July, August and September. W. B. Lawson, Secretary.

Engineers' Club of Cincinnati.—Meets at the rooms of the Literary Club, 25 East Eighth St., on the third Tuesday of each month, excepting July and August, at 6.30 p. m. J. F. Wilson, Secretary, P. O. Box 333, Cincinnati, O.

Engineers' Club of Columbus (O.)—Meets at 12½ North High St. on the first and third Saturdays from September to June. H. M. Gates, 12½ N. High St., Secretary, Columbus, O.

Engineers' Club of Minneapolis.—Meets in the Public Library Building, Minneapolis, Minn., on the first Thursday in each month. H. E. Smith, Secretary, 1620 S. E. Fourth St., Minneapolis.

Engineers' Club of Philadelphia.—Meets at the house of the Club, 1122 Girard St., Philadelphia, Pa., on the first and third Saturdays of each month at 8 p. m., except during July and August. L. F. Rondinella, Secretary.

Engineers' Club of St. Louis.—Meets in the Missouri Historical Society Building, corner Sixteenth St. and Lucas Place, St. Louis, on the first and third Wednesdays in each month. Richard McCulloch, Secretary, 240 N. Spring Ave., St. Louis.

Engineering Association of the South.—Meets in the Berry Block, Nashville, Tenn., on the second Thursday of each month. H. M. Jones, Secretary, 1000 Broad St., Nashville.

Engineers' Society of Western New York.—Holds regular meetings on the first Monday in each month, except in the months of July and August, at the Buffalo Library Building. H. J. Marsh, Secretary.

Engineers' Society of Western Pennsylvania.—Meets at 410 Penn Ave., Pittsburgh, Pa., on the third Tuesday in each month, at 7.30 p. m. R. A. Fessenden, Secretary.

Franklin Institute.—Meets at 8 p. m. on the third Wednesday of each month, except July and August, at 15 S. Seventh St., Philadelphia, Pa. Wm. H. Wahl, Secretary.

Locomotive Foremen's Club.—Meets every second Tuesday in the club room of the Correspondence School of Locomotive Engineers and Firemen, 335 Dearborn St., Chicago.

Louisiana Engineering Society.—Meets on the second Monday of each month at 8 p. m., at 712 Union St., New Orleans, La. J. F. Coleman, Secretary.

Montana Society of Civil Engineers.—Meets in the Public Library Bldg. at Helena, Mont., on the third Saturday in each month at 7.30 p. m. A. S. Hovey, Secretary.

New England Railroad Club.—Meets at Pierce Hall, Copley Square, Boston, Mass., on the second Tuesday of each month. Edward L. Janes, Secretary, P. O. Box 1158, Boston, Mass.

New York Railroad Club.—Meets at 12 W. 31st St., New York City, on the third Thursday in each month at 8 p. m., excepting June, July and August. W. W. Wheatley, Secretary, 168 Montague St., Brooklyn.

Northwest Railway Club.—Meets on the first Tuesday after the second Monday in each month at 8 p. m., the place of meeting alternating between the West Hotel, Minneapolis, and the Ryan Hotel, St. Paul. T. A. Foque, Secretary, "Soo Line," Minneapolis, Minn.

Northwest Track & Bridge Association.—Meets at the St. Paul Union Station on the Friday following the second Wednesday of March, June, September and December, at 2.30 p. m.

Railway Signaling Club.—Meets on the second Tuesday of January, March, May, September and November. C. O. Tilton, Secretary, C., M. & St. P. Ry., West Milwaukee, Wis.

St. Louis Railway Club.—Holds its regular meeting on the second Friday of each month at 3 p. m. H. H. Roberts, Secretary, 512 Commercial Bldg., St. Louis.

Southern and Southwestern Railway Club.—Meets at the Kimball House, Atlanta, Ga., on the second Thursday in January, April, August and November. S. A. Charpiot, Secretary, Savannah, Ga.

Technical Society of the Pacific Coast.—Meets at its rooms in the Academy of Sciences Building, 819 Market St., San Francisco, Cal., on the first Friday in each month, at 8 p. m. Otto Von Geldern, Secretary.

Texas Railway Club.—Meets on the third Mondays of February and August, at place and time chosen at the previous meeting. The next meeting will be held in Austin, Tex., in February, 1900. T. H. Osborne, Secretary, Pine Bluff, Ark.

Western Foundrymen's Association.—Meets in the Great Northern Hotel, Chicago, Ill., on the third Wednesday of each month. A. Sorge, Jr., 1533 Marquette Building, Chicago, is Secretary.

Western Railway Club.—Meets on the third Tuesday of each month except June, July and August, in the Auditorium Hotel, Chicago, Ill. J. W. Taylor, Secretary, 667 Rookery Bldg., Chicago.

Western Society of Engineers.—Meets in the Club rooms in the Monadnock Block, Chicago, Ill., on the first Wednesday of each month, except in January. Special meetings are held on the third Wednesday of each month. Nelson L. Litten, Secretary.

Railway Signaling Club.

The next meeting of the Railway Signaling Club will be held in Boston, Mass., on Nov. 14. C. O Tilton, Secretary, West Milwaukee, Wis.

Canadian Railway Ticket Agents' Association.

This Association held its annual meeting at Winnepeg Oct. 11. The President for the ensuing year is F. W. Churchill, of Collingwood, Ont.; Secretary, E. De Lahooke, London, Ont. The next meeting will be held at Hamilton, Ont., October 10, 1900.

The American Society of Civil Engineers.

At the regular meeting, Wednesday, October 18, a paper entitled "The Reaction Breakwater as Applied to the Improvement of Ocean Bars," by Lewis M. Haupt, was presented for discussion. This paper was printed in the September number of Proceedings.

New York Railroad Club.

The regular meeting of the New York Railroad Club was held at the rooms of the American Society of Mechanical Engineers, 12 West Thirty-first street, New York City, Thursday evening, Oct. 19. The subject of Uniform Dimensions for a Typical Box Car was taken up as a topical discussion. At the last meeting of last season it was decided to hold all subsequent meetings for one year at the rooms of the Transportation Club, but this has been changed and all future meetings of the present season will be held at the former quarters in the rooms of the American Society of Mechanical Engineers.

Engineers' Club of St. Louis.

The four hundred and ninety-fourth meeting was called to order at 8 p. m., October 4, President Colby presiding. Sixteen members and three visitors were present.

The paper of the evening, entitled the Development of the Automatic Machine for Metal Working, was then read by Mr. H. S. Wilson. The probable incidents that led to the invention of the earliest and crudest form of machinery were given, together with short descriptions of the machines. The author then went on to give brief descriptions of old as well as more modern forms of automatic machines. The machines used for automatically making a large variety of articles were briefly described, and some of the wonderful results achieved with them noted. Mr. McFarland exhibited some samples of automatic machine work.

Pacific Coast Railway Club.

The September meeting of this club was held at the Palace Hotel, San Francisco, Saturday evening, Sept. 23. In the absence of the President the chair was occupied by Mr. J. H. Wallace. There were present 26 members and two visitors. The Secretary reported 11 applications for membership. A number of questions were read from the question box, and according to the rules these are printed in the Proceedings, with a view to discussing them at the next meeting. Among the informal discussions at this meeting were one on "The Best Material for Painting the Front End of Locomotives" and one on "The Best Method of Babbitting Engine Truck Brasses." The papers of the evening were by Mr. C. C. Borton, on "Sharp Flanges," and by Mr. T. J. Henderson, on "Compound Engines."

The Committee on Subjects reported a list of 48 subjects, which are printed in the Proceedings, with a view to stimulating members to prepare papers.

The meeting of the present month comes Oct. 21. Papers will be presented on "Passenger Car Trucks," by V. Lemay, Southern Pacific Co., Sacramento, and "Gasoline Engines," by C. P. Pollak.

The Secretary of this club is E. A. Gilbert, Master Car Repairer, Southern Pacific Co., West Oakland, Cal.

Society of Naval Architects and Marine Engineers.

The seventh general meeting of the Society of Naval Architects and Marine Engineers will take place in New York City, at 10 A. M., Thursday, November 16. Through the courtesy of the President and Managers of the American Society of Mechanical Engineers, the meetings will be held in the auditorium of No. 12 West Thirty-first St, the sessions continuing through Thursday and Friday, November 16th and 17th. There will be a banquet at Delmonico's, at 7 P. M., Friday, Nov. 17, to which members and their guests are invited. A list of the papers to be read at this meeting is attached:

1. Coaling Vessels at Sea. By Spencer Miller, Esq., Associate.
2. Causes for the Adoption of Water-tube Boilers in the U. S. Navy. By Engineer-in-Chief Geo. W. Melville, U. S. N., Vice-President.
3. Suggestions as to Improved Appliances for Launching Ship's Boats. By John Hyslop, Esq.
4. The Electric Plants of the Battleships Kearsarge and Kentucky. By Naval Constructor J. J. Woodward, U. S. N., Member.
5. The Increasing Complications in Warships, and How Simpler Arrangements might be Adopted. By Geo. W. Dickie, Esq., Member of Council.
6. Beam Formulae Applied to a Vertically Stiffened Bulkhead, with Some Results. By H. F. Norton, Esq., Member.
7. Notes on Sheathing the U. S. S. Chesapeake. By Naval Constructor Lloyd Bankson, U. S. N., Member.
8. System of Work in a Great Lake Shipyard. By W. I. Babcock, Esq., Member.
9. Overhead Cranes, Staging and Riveter Carrying Appliances in the Shipyard. By James Dickie, Esq., Member.
10. Designs for the Denver Class Sheathed Protected Cruisers. By Chief Constructor Philip Hichborn, U. S. N., Vice-President.
11. Novelties in Ship Fittings. By Assistant Naval Constructor R. M. Watt, U. S. N., Member.
12. Progressive Speed Trials of the U. S. S. Manning. By Prof. C. H. Peabody, Member of Council.
13. Tactical Considerations Involved in Torpedo Boat Design. By Lieut. A. P. Niblack, U. S. N., Associate.
14. On the Action of the Rudder, with Special Reference to the Motion of the Ship while the Helm is being put over. By Prof. Wm. F. Durand, Member of Council.

St. Louis Railway Club.

A meeting of the St. Louis Railway Club was held Friday afternoon, October 13, at the Southern Hotel, St. Louis, Mo. It was announced that Mr. Charles E. Koons, son of the Master Car Painter of the St. Louis Car Works, had been awarded the free scholarship in Blees Military Academy previously referred to in this column, he having the best average in a competitive examination of nine candidates. It was further announced that the paper for the November meeting would be on a mechanical subject and presented by Mr. S. M. Dolan, Master Mechanic of the Wiggins Ferry Company.

Mr. W. W. Ryder, Superintendent of Telegraph of the Chicago, Burlington & Quincy, then read a paper on "The Railroad Telegraph, its Uses and Abuses." Mr. Ryder stated that when he came to write on this subject it seemed unnecessary to treat of the uses of the telegraph, as they were so well understood; he therefore confined himself wholly to the ways in which the railroad telegraph is commonly abused. He first pointed out that the prime function of the telegraph was to enable important business to be transacted quickly, and that it was uneconomical to provide facilities for sending other than really important messages. The telegraph was abused, first, by sending messages of unnecessary length, and, second, by sending messages that could just as well go by mail. A number of instances were cited to illustrate both forms of abuse, which not only cost the road for handling the unnecessary telegrams, but they crowded the wires and delayed the transaction of really important business. Most of the unnecessary telegraphing was done by the traffic department. The matter was one requiring constant attention, as the issuing of circular orders at infrequent intervals only gave temporary relief. One road had adopted the plan of charging each department for telegrams, 10 cents for 10 words, and 20 cents for anything over 10 words, which made the sender of messages realize that it cost the road something for telegrams. The monthly statements of bills for telegrams also gave the heads of departments a check on the use of the telegraph, and this plan had proved about the best way to remedy these abuses.

Western Society of Engineers.

About 125 members and guests of the Western Society of Engineers went to Madison, Wis., last Saturday on the occasion of the inauguration of Prof. J. B. Johnson as Dean of the College of Mechanics and Engineering. A special train of sleeping cars was furnished by the Chicago, Milwaukee & St. Paul, which reached Madison about noon. After luncheon in the Armory, the vistors were shown through the buildings and laboratories used by the science and engineering departments, and they then saw a football game and a boat-race. In the evening Prof. Johnson gave his inaugural address in the University Chapel to a large audience. He very ably discussed four ways in which State Universities could increase their usefulness. First, he was strongly of the opinion that at least the rudiments of sanitary science should and very shortly would be taught in all high-schools; and it became the duty of State Universities to forward this movement and begin by preparing men and women as teachers to fill these places. The second way was to train men both as chemists and mechanical engineers; he held that at this time commercial chemists know practically nothing of mechanics, and mechanical engineers little or no chemistry. It was only through a combination of these courses that men could be suitably trained for responsible positions in with our large industries, and the best results obtained. The third way in which the State Universities could be of use was to work in connection with reputable correspondence schools in so far as offering the students of correspondence schools opportunities to do experimental and laboratory work at the Universities as occasions presented, thus supplementing the instruction given by correspondence. The fourth way was in the establishment of commercial courses somewhat similar to those offered by certain German schools, the aim being to especially fit young men for positions in the Government consular service, and as salesmen and foreign representatives of commercial houses. All of these plans were elaborated and discussed in a most convincing manner, as those who know Prof. Johnson will well understand.

Short addresses were also made by President C. K. Adams, and Prof. N. O. Whitney of the University, Edward Scofield, Governor of Wisconsin, William F. Vilas, Ex-Postmaster General and Ex-Senator from the same State, Mr. Onward Bates, President of the Western Society of Engineers, and Mr. Desmond Fitzgerald, President of the American Society of Civil Engineers.

On the return the party reached Chicago early Sunday morning.

PERSONAL.

(For other personal mention see Elections and Appointments.)

—Mr. H. G. Krake has been appointed Traffic Manager of the American Cotton Co., with headquarters at St. Louis, Mo.

—Mr. E. A. Gordon, heretofore Manager of the New England Car Service Assn., has been appointed Traffic Agent of the American Woolen Co., with headquarters at 112 Ames Bldg., Boston, Mass.

—Mr. C. L. Strauch, Supervisor of the Pennsylvania RR., was struck and almost instantly killed by a west-bound train on Oct. 11. Mr. Strauch was about 35 years of age and a native of Pottsville.

—Mr. F. R. Coates has resigned his position as Roadmaster of the New York, New Haven & Hartford, at Stamford, Conn., to enter the service of the Weber Railway Joint Mfg. Co. as its representative in Chicago.

—Mr. William Howe Smith, for several years Purchasing Agent of the Schenectady Locomotive Works, died at his home in Schenectady, N. Y., Oct. 14. Mr. Smith was connected with the S. L. W. for about 35 years, being at one time Assistant to the President.

—Mr. Frederick Kegler, Division Master Mechanic of the Rutland & Washington Division of the Delaware & Hudson Co., died at his home in Salem, N. Y., Oct. 6. Mr. Kegler was born in Germany in 1832, and came to the United States when he was about 12 years of age.

—Mr. James O. Pease, Treasurer of the Phoenix Iron Company, died at his home in Germantown, Pa., Oct. 14. He was born in Washington, Miss., in 1818. Mr. Pease was engaged in the dry goods business in Philadelphia until 1869, when he became Treasurer of the Phoenix Iron Company, which position he held at the time of his death.

—Mr. Arthur Twining Hadley, LL.D., was inaugurated as President of Yale University on Wednesday. The chapel services were simple, grave and impressive and the popular celebration of the evening was enthusiastic and also impressive. We need not enter into particulars, as these have been printed at length in the daily newspapers.

—Mr. George R. Brown, for many years and until the recent transfer of the company to the New York Central, General Superintendent of the Fall Brook Railway, has been elected Second Vice-President and General Manager of the New York & Pennsylvania, a road extending southward into Pennsylvania from Canisteo, N. Y., on the Erie, a few miles east of Hornellsville. Mr. Brown was the originator of Brown's discipline. This plan—discipline of employees without suspension—is now in force on 20 prominent railroads and many smaller ones.

—Mr. Harvey Middleton, who has just resigned as Mechanical Superintendent of the Baltimore & Ohio, was born at Philadelphia, Pa., in 1852. Mr. Middleton entered railroad service as Machinist on the Philadelphia & Erie in 1876, and two years later became Assistant Master Mechanic of the same road. From then until 1896, when he was appointed General Superintendent Motive Power of the B. & O., Mr. Middleton has been connected with various roads as Master Mechanic, Superintendent Machinery and Superintendent Motive Power and Machinery.

—Mr. Joseph Wood, an old locomotive engineer, who ran on the John Bull in New Jersey in 1831, died in Red Bank, N. J., on Oct. 17, being about 90 years old. Mr. Wood is spoken of as "the oldest locomotive engineer in the country." On the John Bull he was wood-passer, but he soon after became a runner on the Camden & Amboy, and subsequently was Master Mechanic of the Raritan & Delaware Bay road. He was for many years in the employ of the roads now constituting the Pennsylvania, and during the War of the Rebellion he was employed by the Government in Virginia as Superintendent of Locomotive Water Supply. Mr. Wood was interested in many railroad inventions, and he was himself the inventor of Wood's frog. In this frog both wings are loose, and there is no spring. When a flange passes through, the wing remains in the position in which it is left.

—Mr. Ira A. McCormack, General Superintendent of all the lines owned and controlled by the Brooklyn Rapid Transit Co., has resigned that position to become Managing Director and Vice-President of the Syracuse (N. Y.) Rapid Transit Co. Mr. McCormack left the Lake Shore & Michigan Southern R. R. August 1, 1895, to accept the position of General Superintendent of the Brooklyn Heights R. R., the operating company of the lines of the Brooklyn Rapid Transit Co., and in May of this year his authority was extended over the entire system of nearly 500 miles, including the steam and street surface and elevated roads recently acquired. Mr. McCormack, previous to his connection with the Brooklyn Heights, had had about twenty years' experience on steam railroads as telegraph operator, brakeman, conductor and operating officer in various positions.

—Mr. John E. Sanford has retired from the Massachusetts Board of Railroad Commissioners on account of ill health, and Mr. James F. Jackson has been appointed to succeed him. At a meeting of the new Board Mr. Jackson was elected Chairman. Mr. Sanford has been the Chairman of the Commission for seven years. He has filled the office with dignity and discretion, and his acts have uniformly been characterized by good judgment and wise foresight. His personal integrity is recognized by everybody. As the Massachusetts commission is usually constituted, the chairman is the most active member, especially in all matters of a judicial nature, so that the fact that the decisions of the Board have been noted for their fairness and their vigorous support both of the rights of citizens and those of the railroads, is to a considerable degree a personal tribute to the ability of the chairman. Mr. Sanford has long been prominent in political circles in Massachusetts, having been President of the Senate, and subsequently a member of the Land and Harbor Commission before being appointed to the railroad commission.

—Mr. J. N. Barr, Superintendent of Motive Power of the Chicago, Milwaukee & St. Paul, has resigned, to take effect November 1. He goes to the Baltimore & Ohio as Mechanical Superintendent of that system, succeeding Mr. Harvey Middleton, who has resigned. Mr. Barr went into the service of the Pennsylvania Railroad at Altoona from Lehigh University, and in 1885 he left Altoona to take service with the Chicago, Milwaukee & St. Paul, where he has been ever since. For a year he was Mechanical Engineer, for two years Superintendent of the Car Department and since 1888 he has been Superintendent of Motive Power. Mr. Barr stands in the front ranks of motive power and rolling stock engineers. For many years he has been deeply interested in all the numerous problems, large and small, which affect those departments, and it is not too much to say that his work has been an important element in advancing American practice. He was for a time in charge of the wheel foundry at Altoona, invented a contracting chill which is now largely used, and has done a great deal of scientific work in improving the making and use of wheels. Besides being a scientific man he is an administrative officer of unusual energy and skill. For years he has been one of the prominent members of the Master Car Builders' Association and Master Mechanics' Association, where he has done a great deal of valuable work. Within a year or two he has gone through a severe illness, but we understand that his health is now quite restored, and as he is a man of powerful physique we may expect that he has many useful and valuable years ahead of him.

ELECTIONS AND APPOINTMENTS.

Baltimore & Ohio.—J. N. Barr, heretofore Superintendent of Motive Power of the Chicago, Milwaukee & St. Paul, has been appointed Mechanical Superintendent of the B. & O., succeeding Harvey Middleton, resigned. J. M. Barrett has been appointed Superintendent of the Wheeling, Benwood and Bellaire Terminals, with headquarters at Wheeling, W. Va.; effective Oct. 10.

Barclay.—R. E. Dunston has been appointed Superintendent, succeeding I. O. Blight.

Boston & Albany.—Reginald Foster and Albert C. Houghton were on Oct. 5 elected Directors, succeeding Richard Olney and Chauncey M. Depew.

Burlington, Cedar Rapids & Northern.—J. G. Farmer has been appointed Assistant General Passenger Agent, with headquarters at Cedar Rapids, Ia., succeeding J. Morton, General Passenger Agent, deceased.

Canadian Pacific.—C. R. Hosmer, Manager Telegraph, has been elected a Director.

Central of New Jersey.—C. F. Adams has been appointed Superintendent of Telegraph, succeeding Robt. Stewart. F. L. Morse, recently appointed Assistant to the Division Superintendent, has been appointed Trainmaster, succeeding Jos. T. Olhausen, resigned to accept a position with Baltimore & Ohio.

Chesterfield & Lancaster.—The officers of this company, referred to in the Construction column, are: President, G. J. Redfearn, Chesterfield, S. C.; Secretary and Treasurer, E. F. Mulloy, Chesterfield. The directors are: E. F. Mulloy, D. B. Douglass, I. P. Mangum, T. L. Huntley, D. M. Barentine, Chesterfield, S. C.; H. W. Finlayson and W. P. Pollock, Cheraw, S. C.; D. H. McGregor, Ruby, S. C., and J. L. Lowry, Jefferson, S. C.

Chicago & Alton.—W. H. Starr, formerly General Manager of the North Hudson County (electric) RR., has been appointed Superintendent of the Western Division of the C. & A., with headquarters at Kansas City, Mo. He will have entire charge of and be responsible for all matters pertaining to the maintenance and operation of the western division. The following division officers will report exclusively to the Superintendent: The Division Engineer and his assistants, the Trainmaster and his assistants, the Roadmaster and his assistants, the Master Mechanic and his assistants. General Superintendent Gray has issued the following order: "The C. & A. will be operated in two divisions, known as the western and eastern divisions. The western division will comprise all that part of the line west of Roodhouse. The eastern division will comprise the lines between Chicago and St. Louis, via Springfield and Roodhouse, together with the line between Dwight and Peoria."

Chicago, Milwaukee & St. Paul.—J. N. Barr, Superintendent of Motive Power, with headquarters at West Milwaukee, Wis., has resigned.

Chicago Terminal Transfer.—At a meeting of the stockholders, H. Budge, C. H. Godfrey and C. T. Parker were elected Directors, succeeding S. Neustadt, W. A. Read and J. D. Rockefeller, Jr.

Cincinnati, Hamilton & Dayton.—At a meeting of the stockholders, G. R. Balche and L. Maxwell, Jr., were elected Directors.

Cincinnati, New Orleans & Texas Pacific.—E. Zimmerman has been elected a Director, succeeding H. Taylor.

Cincinnati, Portsmouth & Virginia.—R. A. Williams has been elected a Director, succeeding W. D. Frishmuth, Jr.,

Delaware & Hudson.—Robert C. Blackall, who retired at his own request as Superintendent of Motive Power, has been appointed Consulting Mechanical Superintendent, with headquarters at Albany, N. Y. The duties of Superintendent of Motive Power will be performed by J. R. Slack, Assistant Superintendent of Motive Power, at Albany, N. Y.

Delaware, Lackawanna & Western.—E. S. Auchincloss has been appointed General Agent of the Freight Department, with headquarters at 26 Exchange Place, New York City, and the office of Assistant General Freight Agent is abolished. The headquarters of E. G. Russell, General Superintendent, will, about Nov. 1, be transferred to New York City. F. P. Hamilton has been appointed Trainmaster, with headquarters at Wilkesbarre, Pa.

Great Northern.—W. D. Scott has been appointed Assistant Superintendent of the Breckenridge Division, with headquarters at Breckenridge, Minn., succeeding E. J. Hawn, transferred; effective Oct. 10. The office of Master Mechanic of the Terminals Division having been abolished, all duties pertaining to that position will hereafter be performed by A. C. Deverell, Superintendent of St. Paul shops; effective Oct. 10.

Illinois Central.—J. M. Dickinson has been appointed General Solicitor, succeeding J. Fentress, resigned. Geo. J. Hatz has been appointed Division Master Mechanic, with headquarters at E. St. Louis, Ill., succeeding A. C. Beckwith, resigned.

Kansas City, St. Joseph & Council Bluffs.—R. K. Smith has been appointed Assistant Superintendent, with headquarters at St. Joseph, Mo.

Louisiana & Arkansas.—E Richards, General Manager, with headquarters at Stamps, Ark., has resigned.

Louisville & Nashville.—Mord Roberts, formerly Master Mechanic of the St. Louis, Iron & Southern, has been appointed General Master Mechanic, with headquarters at Louisville, Ky.

Milwaukee & Superior.—E. J. Lansing has been appointed Auditor, succeeding G. W. Wilson. A. M. Campbell has been appointed General Freight Agent.

Minneapolis & St. Louis.—A. P. Tanner has been appointed General Freight Agent.

Missouri, Kansas & Texas.—A. C. Loucks, heretofore Acting Master Mechanic of the Missouri, Kansas & Texas of Texas, has been appointed Master Mechanic, with headquarters at Denison, Tex., of the same company.

Missouri Pacific.—J. R. Wentworth has been appointed Superintendent of the Missouri Division of the St. Louis, Iron Mountain & Southern line of the M. P., with headquarters at De Soto, Mo., succeeding D. Hardy, transferred.

New England Car Service Ass'n.—C. L. Mayne, formerly General Superintendent of the Fitchburg, has been elected Manager of the N. E. C. S. A., succeeding E. A. Gordon.

New York Central & Hudson River.—J. B. McIntyre, formerly Engineer of the Beech Creek (leased line of the N. Y. C. & H. R. RR.), has been appointed Engineer of Construction of the N. Y. C. & H. R. RR.

New York & Pennsylvania.—G. R. Brown, late General Superintendent of the Fall Brook Ry., has been elected Second Vice-President and General Manager of the N. Y. & P., with headquarters at Canisteo, N. Y.

Omaha, Kansas City & Eastern.—A. W. Quackenbush has been appointed Master Mechanic, succeeding J. W. Stokes, resigned. Robert Alexander has been appointed Trainmaster, with headquarters at Stanberry, Mo.

Pacific Coast Co.—J. G. Woodworth has been appointed Traffic Manager.

Pennsylvania.—A. J. Gillingham, heretofore Assistant Auditor, has been appointed Auditor of Passenger Receipts, relieving M. Riebenack, Assistant Comptroller, to this extent. Samuel Anderson has been appointed Assistant Auditor of Passenger Receipts, succeeding Mr. Gillingham. H. C. McKeever has been appointed Assistant Auditor of Freight Receipts, a position recently created. E. A. Stockton has been appointed Assistant Auditor of Disbursements and James H. Hunt has been appointed Chief Accountant, succeeding Mr. Stockton.

Pennsylvania Co.—C. E. Walton, Trainmaster, with headquarters at Ft. Wayne, Ind., has resigned.

Philadelphia & Reading.—A. J. Flynn, Supervisor, with headquarters at Tamaqua, Pa., has resigned.

Pittsburgh & Western.—J. L. Kirk, Auditor, will assume the duties of Secretary, owing to the resignation of T. J. Crump.

St. Paul & Duluth.—F. H. Leggett has been elected a Director.

State Line & Sullivan.—R. E. Dunston has been appointed Superintendent.

Staten Island Rapid Transit.—W. L. Bull, Samuel Thomas, H. H. Rogers, Thomas F. Ryan and George B. M. Harvey have been elected Directors.

Vera Cruz & Pacific.—The general offices of this company have been transferred from Córodoba to Orizaba, Mexico.

West Virginia Northern.—J. M. Templeton has been appointed Superintendent, with headquarters at Kingwood, W. Va.

Wood River Branch.—At a meeting of the stockholders Edward G. Buckland and R. C. Watrous were elected Directors.

RAILROAD CONSTRUCTION.
New Incorporations, Surveys, Etc.

ARIZONA ROADS.—Locating surveys and grading are reported in progress for the line of the Ray Copper Mining Co., Ltd., of Riverside, Ariz., from its mines on Mineral Creek near Riverside. (Oct. 6, p. 701.)

ARKANSAS & OKLAHOMA.—Track is laid on the extension from Gravett, Ark., northwest 11½ miles to Southwest City, Mo. Grading is in progress for a further extension from Southwest City to Grand River, I. T., 16 miles. J. M. Bayliss, of Cassville, Mo., is President. (July 28, p. 547.)

ATCHISON, TOPEKA & SANTA FE.—The Shutt Improvement Co., of Pueblo, Col.; Sparr & Stubbs, Lawrence, Kan.; Ware & Maney, of Blue Earth, Minn., and A. Moore, of Newton, Kan., have contracts for the Eastern Oklahoma extension from Guthrie, Okla., northeast via Perkins, Stillwater and Pawnee to Coffeeville, Kan. (Sept. 29, p. 685.)

BANGOR & AROOSTOOK.—Grading is practically completed on the extension from Caribou, Me., north 33 miles to Van Buren. About 20 miles of track is laid and it is stated that the line will be completed this month. John B. Carter of Caribou is contractor. (June 22, p. 460.)

BELLINGHAM BAY & EASTERN.—This company has begun surveys, according to report, for a line from Blue Canyon, Wash., to run east about five

miles to Wickersham, on the Seattle & International. The company is already building the connecting link from Blue Canyon to the main line. (Sept. 22, p. 667.)

BENNINGTON & RUTLAND.—The company is relaying its track north of Sunderland, Vt. It is stated that over 90 carloads of rails will be laid this season.

BLACK RANGE.—Surveys are reported completed and building is to be begun early in 1900 on this line from Magdalena, N. M., on the Atchison, Topeka & Santa Fe, to run south about 90 miles, via Cat Mountain and Robinson, to Chloride. Chas. F. Grayson, of Silver City, N. M., is President. (Oct. 6, p. 701.)

BRADFORD, BORDELL & KINZUA.—An officer confirms the report that this company is renewing its ties with those of standard gage length, but the road may not be broadened for two or three years. (Sept. 29, p. 685.)

BUFFALO, ROCHESTER & PITTSBURGH.—J. P. Scanlon of New Castle, Pa., is excavating for new tracks at New Castle, to be used by this company and the Pittsburgh & Western.

CANADIAN PACIFIC.—The company has decided to begin double tracking its entire line between Fort William, Ont., and Winnipeg. This will be a difficult and expensive undertaking, but the enormous increase in the volume of business makes it a necessity. The work of widening the roadbed and bridges was begun some time ago, and it is to be continued this autumn, so that the laying of the steel for the second track can be begun without delay. (May 5, p. 323.)

CANE BELT.—Track laying is reported begun on the extension from Eagle Lake, Tex., northeast about 17 miles to Sealy. (Sept. 29, p. 685.)

CENTRAL OF GEORGIA.—The company has completed a spur at Savannah, Ga., to connect with the Plant System.

CHATTAHOOCHEE & GULF.—Grading is begun, according to report, on this line from Columbia, Ala., southwest about 88 miles to Elkton. It is to run through timber and agricultural country. A. V. Lane of Savannah, Ga., is interested. (July 14, p. 515.)

CHESTERFIELD & LANCASTER.—The route of this proposed line is from Cheraw, S. C., on the Seaboard Air Line, to run west about 50 miles, via Chesterfield, Ruby, Mt. Croghan, Hornsboro, Minden and Plains to Lancaster. The county of Chesterfield has voted $50,000 6 per cent. 30-year coupon bonds in aid of the road. The proposed line is through a fine farming country, and within reach of timber, granite and various mineral deposits. (July 28, p. 547.) The officers are given under Elections and Appointments. (Official.)

CHICAGO & NORTHWESTERN.—Grading is completed on the Harlan & Kirkman extension from Kirkman, Ia., south seven miles to Harlan, on the Chicago, Rock Island & Pacific. (Aug. 25, p. 603.)

CHICAGO, BURLINGTON & QUINCY.—Five miles of track is reported laid on the Grant City & Southern extension from Grant City, Mo., south about 27 miles to Bethany, where connection is to be made with a line from Chariton to St. Joseph. (Aug. 11, p. 575.)

CHICAGO, MILWAUKEE & ST. PAUL.—J. H. Flick of Davenport, Ia., has the contract for grading the extension from a point northwest of Yankton, S. D., to run west about 20 miles, via Tabor, to Tyndall. Alfred Brainerd and John Chamberlin of Omaha, Neb., are sub-contractors. Materials are on hand, it is stated, for two miles of the road, and track layers will closely follow graders. (Sept. 15, p. 649.)

CHIHUAHUA & PACIFIC.—Track is reported laid from Chihuahua, Mexico, west 98 km. (61 miles), to San Andres, on this line to Guerrero, 124 miles. McCarthy & Reichardt of Little Rock, Ark., and J. M. Dudley of Chihuahua, Mexico, have the contract. Edward S. Safford of Guerrero, Mexico, is Chief Engineer. (July 7, p. 499.)

CHICAGO, IOWA & DAKOTA.—An officer writes with reference to the reported extension northwest to Alden, Ia., that, so far as he is at present aware, his company is contemplating no extension. (Oct. 6, p. 701.)

CHOCTAW, OKLAHOMA & GULF.—Surveys are reported begun for the proposed extension west about 200 miles to Amarillo, Tex., on the Atchison, Topeka & Santa Fe. (Aug. 18, p. 589.)

Rail laying is reported completed on the entire Choctaw & Memphis connecting line from Hull, I. T., east 164 miles to Little Rock. It will be some weeks, however, before trains can be run over the entire line. (Aug. 11, p. 575.)

CINCINNATI, NEW ORLEANS & TEXAS PACIFIC.—The annual report states that there are only 18½ miles of 60-lb. rails remaining on this line. The replacement will require about 2,000 tons of 75-lb. rail, which has been bought and the relaying is in progress.

COLORADO & WYOMING.—Rail laying is to be begun soon, according to report, on a 10-mile section between Badger, Wyo., and the North Platte River, on this road from the main line of the Colorado & Southern north to Hartville. It is being built by the Colorado Fuel & Iron Co. of Denver, Colo. (June 30, p. 482.)

COLUMBIA VALLEY.—Surveys are not yet completed, and the company is obtaining right of way for its proposed line from Wallula, Wash., along the north bank of the Columbia River to its mouth. (Aug. 11, p. 575.) L. Gerlinger, of Vancouver, Wash., President of the Portland, Vancouver & Yakima, is President. (Official.)

EAST & WEST.—The project is being revived for an extension of this line from Pell City, Ala., west about 30 miles into Birmingham. The newly incorporated Birmingham Belt, according to report, is to be used for entrance into that city. (B. B., Sept. 15, p. 650.)

EL PASO & NORTHEASTERN.—Surveys are completed, according to report, for an extension of the Alamagordo & Sacramento branch from the present terminus at Toboggan, N. M., east 15 miles over the summit of the Sacramento Mountains, via Cloudcroft to the eastern slope. Building is to be begun soon. The branch was built last year.

ERIE.—The Chief Engineer writes, with reference to the Park St. crossing at Montclair, N. J., that by a decree of the Chancellor of New York the proposed electric railroad on Valley Road is directed to go under the tracks of the Greenwood Lake line at that point. In order to accomplish this the tracks of the G. L. line will be raised some 7 or 8 ft. at the Valley Road crossing. This necessitates the raising of the tracks at the present grade crossing of Watchung Ave. and Park St., immediately east of the Valley Road Crossing. It is therefore proposed to consolidate Watchung Ave. and Park St., and to take them through one opening under the railroad. (Oct. 13, p. 719.)

The officer also confirms the statement that a large yard is being built by the company in partnership with the Pennsylvania Co., for the accommodation of the Ohio Steel Co., at Youngstown, O.

GEORGIA & ALABAMA.—Application has been made to the city of Savannah, Ga., for permission to extend the company's line on Bay St. to the City Exchange, from the new freight depot soon to be built on the west side of the city.

GRAND TRUNK.—An officer writes that for some months past the company has been double tracking the line between Vaudreuil, Que., and St. Annes, a distance of four miles. This company is building double-track bridges in place of former single-track ones across the two branches of the Ottawa River at Vaudreuil and St. Annes. The intervening space is an island known as Ile Perrot. (Sept. 29, p. 685.)

GREAT NORTHERN.—Grading is reported begun on the cut-off from the Spokane Falls & Northern, a short distance north of Dragoon, Wash., to run southeast about three miles to the G. N. main line. It is stated that the intention is to abandon the section S. F. & N. into Spokane when this section is completed.

HARRISBURG & SOUTHERN.—Preliminary surveys are reported completed for this proposed line from a point on the Eldorado branch of the Illinois Central near Eldorado, to run south to a point on the north bank of the Ohio, and from Harrisburg west to Marion. The company hopes to have the last-named line completed by Jan. 1. Seth F. Crews of Chicago is President, and S. S. Barger of Eddyville, Ill., a director. (July 28, p. 547.)

IRONTON.—The company has about 50 men at work on its spur of 3,000 ft. from Egypt, Pa., to Butz's farm. (Oct. 6, p. 701.) The maximum grades are 0.8 per cent. The work is being done by the company. (Official.)

JACKSONVILLE & SOUTHWESTERN.—This line is reported completed from Jacksonville, Fla., south 54 miles to Lake Butler, and another section of 33 miles is building from Lake Butler to Newberry. It is projected to Manatee Springs, in all 105 miles. W. E. Cummer is President, and Geo. L. Davis Chief Engineer, both of Jacksonville, Fla.

LEHIGH VALLEY.—The company has been making preliminary surveys between Penn Haven and Glen Onoko, Pa., merely with a view of ascertaining what could be done in straightening the line and shortening the distance. It has not been determined as yet what active steps will be taken. (Official.)

The New York State Railroad Commission has given a hearing to the reapplication of the Lehigh & Lake Erie for an extension from Tifft Farm to connect with the main line of the L. V., near Depew. (Sept. 1, p. 619.)

LOUISIANA & ARKANSAS.—Track is laid from Sibley, La., to Black Lake, 20 miles, on the extension from Sibley south 65 miles. Grading is in progress on a 10-mile section beyond Black Lake. (Dec. 16, 1898, p. 904.)

MARSHALLTOWN & DAKOTA.—Grading on the extension from Fraser Junction, Ia., to Gowrie, 19 miles, is completed. Track is laid from Fraser Junction of Boxholm, five miles. Surveys are in progress on a further extension from Fraser toward Story City, Ia. It is the intention to build this extension next year, and the line is to be made ready for grading this fall. Hamilton Browne of Marshalltown is President. (Sept. 8, p. 633.)

MEXICAN CENTRAL.—The company has over 1,500 men extending its Guadalajara line from Ameca, State of Jalisco, Mexico, to San Marcos. The line is to be extended on to the Pacific coast.

MEXICAN ROADS.—A. O. Bailey of Columbus, N. M., has obtained concessions from the Mexican Government for his line which he proposes to run from Deming, N. M., on the Southern Pacific, south 35 miles to Columbus, on the border, and thence south through Mexico, via Guerrero, State of Sonora, to Agiabampo, in all about 300 miles.

The concession made to Edward Van Buren Hoes of Guaymas, Sonora, for the Pacific Coast Coal Co., is for a line from that harbor on the Gulf of California, to run northeast 65 miles to San Marcial to deposits of the coal company. A large land subsidy goes with the concession. (Aug. 18, p. 589.)

The line of the Bradley-Watkins Lumber Co., from a point four miles east of Hermansville, on the Minneapolis, St. Paul & Sault Ste. Marie, to Spaulding, on the Chicago & Northwestern, 2.2 miles, is completed.

MISSOURI MIDLAND.—The company is reported to have completed this line from Columbia, Mo., southwest 8½ miles to McBain, near Kennard on the Missouri, Kansas & Texas. (Aug. 4, p. 561.)

Surveys are being made, according to report, from Columbia southeast about 35 miles, via Fulton, to Mokane, Callaway County. Charles Wiggins of St. Louis, Mo., is President.

MONTANA.—The extension of this line from Leadboro, Mont., is reported completed to Martinsdale, 20 miles. Cook & Woldson, of Helena, have the contract. (May 26, p. 379.)

MT. PLEASANT, TENNESSEE RIVER & MILAN.—This company, whose incorporation in Tennessee on Oct. 7 was noted last week, is to build from Mt. Pleasant northwest about 55 miles to the Tennessee River, and thence to Milan in Gibson County. The incorporators are: J. H. Fussell, A. M. Hughes and W. B. Gordon of Columbia, Tenn.; H. F. Alexander and J. H. Cunningham, Mt. Pleasent, Tenn. (Oct. 13, p. 719.)

NEW YORK CENTRAL & HUDSON RIVER.—Large improvements are reported in progress at Ravena, N. Y., including 18 miles of additional trackage.

NEW YORK, NEW HAVEN & HARTFORD.—A long switch track is being laid at Seymour, Conn., to accommodate the Fowler Nail Co. and the Seymour Mfg. Co.

NORFOLK & WESTERN.—At the annual meeting it was decided to build a cut-off from Belsprings, Va., east 15 miles to Christiansburg.

NORTHERN PACIFIC.—Manager Whyte, of the Canadian Pacific, has notified this company that it would be permitted to cross the C. P. R. tracks at Portage la Prairie, Man., on Oct. 12. The N. P. has already built about five miles of its line, having carted all its material across the C. P. R. track. It is building from Portage la Prairie northwest about 200 miles toward the Saskatchewan Valley. (Aug. 25, p. 603.)

The company has accepted the section of the Clearwater Short Line from Spalding, Ida., to Cul de Sac. This is on the extension from Lewiston east toward Missoula, Mont. (July 7, p. 499.)

Plans are being prepared, according to report, for a cut-off from Palouse City, Wash., west about 90 miles to Connell, to be used in connection with the Clearwater extension.

Track laying is in progress on the cut-off on the main line near Seattle, Wash., from Palmer west 22 miles to Auburn. (Sept. 8, p. 633.)

The extension of the Cooperstown branch from Cooperstown, N. D., northwest 25.15 miles to McHenry is completed. (Aug. 18, p. 589.)

NORTHWEST TERRITORY ROADS.—The surveying party which was sent out in May last by the Dominion Government to explore a route from the headwaters of the Skeena River to the headwaters of the Stikeen have arrived at Victoria, B. C., having satisfactorily completed its work.

OHIO & KENTUCKY.—M. Lally, of Detroit, Mich., has the contract for grading this line from Jackson, Ky., the terminal of the Lexington & Eastern, to run northeast 26 miles through mineral and timber lands into Morgan County. R. M. Broas, of Lexington, is Chief Engineer. (Oct. 6, p. 701.)

OHIO RIVER & CHARLESTON.—Surveys are completed and contracts let to W. O. Lipscomb of Gaffney, S. C., for the proposed extension of this line from the Tennessee State line southeast 10 miles up the Toe River in North Carolina to the mouth of Caney River. For several miles through the mountains the work is rather heavy. The maximum grade is one per cent., maximum curves 12°. (Sept. 15, p. 650; Sept. 29, p. 685.) There are two bridges, one 480 ft. long and one 240 ft., to be built with wooden Howe truss over 120 ft. spans, on good masonry piers. (Official.)

OREGON RAILROAD & NAVIGATION.—This company, according to report, is building a switch at Portland, Ore., on East Second St.

OREGON SHORT LINE.—Grading is entirely completed and track laying in progress on the St. Anthony branch from Idaho Falls, Id., northeast 37.3 miles, via Willow Creek, Rigby, La Belle, Texas, Brexburg and Teton to St. Anthony. The company expects to have the line completed by Nov. 15 (Sept. 8, p. 633.)

PENNSYLVANIA.—Surveys are reported completed for a branch line to the Buttonwood, Pa., colliery, below Breslau, three-fourths of a mile long.

PHILADELPHIA & READING.—Peacock's Cut above Tuckerton, Pa., is being widened, according to report, to make room for a third track.

PONTIAC PACIFIC JUNCTION.—A portion of the company's line from Alymer, Que., northeast nine miles along the north side of the Ottawa River to Ottawa, is already graded and rails will be laid on this section soon. The heavy grading of the other portion is to be completed, if possible, before winter sets in, and the company hopes to have the line ready for operation next spring. (Aug. 11, p. 576.)

RARITAN RIVER.—The company, according to report, is extending its track several hundred feet toward the center of New Brunswick, N. J., preparatory to building a new station.

ST. LOUIS, CARUTHERSVILLE & MEMPHIS.—This line is reported completed from Caruthersville, Mo., to Pocono, 10 miles, and grading is in progress from that point to Blythesville, Ark., 17 miles. The company expects to have the road completed to that point by Jan. 1. I. H. Burgoon, of Caruthersville, is General Superintendent.

ST. LOUIS, IOWA & NORTHERN.—This company is reported to have made close contract agreement with the St. Louis, Kansas City & Colorado to give entry in the city of St. Louis. The road as projected is from Eldon, Ia., south to St. Louis, Mo. L. H. Sawyers of Eldon, Ia., is President. (June 2, p. 393.)

ST. PAUL & DULUTH.—The President is reported as stating that the company will build extensions next spring at Rice Point and West Superior, Wis., to handle wheat to and from the elevators at the head of Lake Superior.

SALEM & PACIFIC COAST.—The business men of Salem, Ore., have decided to aid this company in its project to build from a point opposite Salem, on the Willamette River, southwest about 90 miles, via Eola and Falls City, to Newport on the Pacific Ocean. The company proposes to acquire the franchises of the Luckiamute Valley & Western, which has several miles of track completed between Falls City and Salem. (Sept. 8, p. 633.)

SAN FRANCISCO & SAN JOAQUIN VALLEY.—Track laying is reported completed 15 miles west of Stockton on the extension from that city to Point Richmond, opposite San Francisco. Work is in progress on the 1,680 ft. steel viaduct over the end of the Alhambra Valley, 11 miles west of Antioch. This will require about two months to put in position. Track is being laid to the viaduct from Antioch. The company hopes to have the entire line to San Francisco ready by the end of the year. (Aug. 11, p. 576.)

SAN JORGES BAY & EASTERN.—This company was incorporated in California Oct. 2, with a capital stock of $100,000, to build a railroad in the State of Sonora, Mexico, from San Jorges Bay, on the Gulf of California, to run to the Los Pintos mines in the Altar District, 13 miles. The directors are: J. H.

Holmes, C. P. Morehouse, J. D. Thompson, W. R. Staats and W. S. Wright of Pasadena, Cal.

SOUTHERN PACIFIC.—Grading is reported begun on the Mohawk branch from Henderson, Ore., northeast 22 miles up the Mohawk River. This is the line of the Booth-Kelly Lumber Co. of Eugene, heretofore referred to under Oregon Roads. John S. Bays of Portland, Ore., has the contract. (Oct. 6, p. 702.)

SOUTHERN.—With reference to the proposed extension from Johnston, S. C., north to Saluda, and the cut-off between Cleveland, Tenn., and McDonalds, an officer writes that there is practically no foundation for the report that there is no apparent probability of building these lines. (Oct. 13, p. 719.)

SOUTH POTOMAC.—This company has not made arrangements yet for any survey except a preliminary reconnaissance, for this line from Romney, W. Va., southwest about 75 miles, via Moorefield and Petersburg, to Franklin. The work will be rather light except for a short distance, where it will be exceedingly heavy. (Oct. 6, p. 702.) S. M. Manifold of York, Pa., is Vice-President and Chief Engineer. (Official.)

SUMPTER VALLEY.—C. W. Nibley, President of this line, is reported as stating that the company will build a spur from a point about six miles southeast of Sumpter, Ore., to run to Durkee.

SWAN VALLEY.—This company, incorrectly reported as Swan Valley & Columbia (Sept. 29, p. 686), was incorporated in Tennessee Sept. 20, with a capital stock of $10,000, to build a railroad from a point on Duck River, Hickman County, at the mouth of Swan Creek, to run up Swan Valley to Columbia, Tenn. The incorporators are: R. H. Wright, W. M. Bates and J. A. Bates, Centreville, Tenn.; John A. Pitts and C. C. Christopher, Nashville, Tenn.

TEXAS CENTRAL.—Grading is reported completed for the entire extension from Albany, Tex., northwest 40 miles to Stamford, and track is laid for 10 miles out from Albany. (July 14, p. 515.)

TEXAS NORTHERN.—Arrangements are being made, according to report, for building this independent line from Anderson, Tex., south about 12 miles to Stoneham, on the Conroe Branch of the Atchison, Topeka & Santa Fe. T. C. Buffington of Anderson, is Vice-President, and H. J. McNair, Chief Engineer. (April 22, p. 289.)

ULSTER & DELAWARE.—Grading is reported practically completed from Bloomville, N. Y., to East Meredith, about eight miles, and rails are laid for about 3½ miles out from Bloomville. Grading is being pushed beyond East Meredith to Davenport Center. (Aug. 11, p. 576.)

UNION PACIFIC.—Surveys are reported in progress for a cut-off west of Rawlins, Wyo., which will somewhat lengthen the distance to Rock Springs, but reduce the grades.

On the extensions east of Rawlins grading is completed, and track laying in progress. These cut-offs extend from Howell to Hatton, 15.34 miles; from Lookout to Medicine Bow, 24.85 miles, and from Hanna to Dana, 8.15 miles. (Aug. 11, p. 576.)

VIRGINIA ROADS.—Captain Bibb, Superintendent of the Carter Syndicate Iron Mines, is reported building a spur from Montvale, on the Norfolk & Western, to run south four miles to the company's mines on Blue Ridge Mountains.

WABASH.—At the annual meeting on Oct. 11, a mortgage of $1,800,000 was voted for building the Moulton, Albia & Des Moines extension now under construction from Moulton, Ia., north 28.3 miles, to Albia. (July 14, p. 515.)

WELLSBURG & WHEELING.—Bids are to be asked soon for rails and rolling stock for this line from Lazearville, W. Va., opposite Wellsburg, O., to run south along the east bank of the Ohio about 20 miles, to Wheeling. The company is not yet fully organized. (Sept. 29, p. 686.) J. A. Miller of Wheeling, W. Va., is an incorporator. (Official.)

WHEELING AND LAKE ERIE.—Contracts are reported let for cutting down a number of grades between Massillon, O., and Toledo.

WICHITA & SOUTHERN.—Right of way is reported secured for this line from Wichita, Kan., south via South McAlester, I. T., to Denison, Tex. O. H. Bentley, of Wichita, is President. (March 3, p. 162.)

GENERAL RAILROAD NEWS.

ATCHISON, TOPEKA & SANTA FE.—The Atlantic & Pacific Income Bondholders' Committee gives notice to holders of these bonds that the Manhattan Trust Co., New York, or the American Loan & Trust Co., Boston, will pay the $25 agreed upon for each $1,000 bond deposited (Sept. 22, p. 668.)

BOSTON & MAINE.—At the annual meeting held at Lawrence, Mass., Oct. 11, the stockholders voted to buy the Portsmouth & Dover (Oct. 13, p. 720), the Portland, Saco & Portsmouth (Sept. 29, p. 686), and the Portland & Rochester, lines already controlled by the company.

CANADA EASTERN.—The Alexander Gibson Ry. & Manufacturing Co. has taken over this property. Notice of the purchase was given some months ago. (Feb. 17, p. 134.)

CENTRAL OHIO.—Mark T. Cox, Arthur P. Sturges and Wm. Church Osborn have brought suit against this company to recover $107,800 interest coupons on mortgage bonds of the Sandusky, Mansfield & Newark, and additional interest on the unpaid coupons. (July 21, p. 531.)

CENTRAL PACIFIC.—Speyer & Co., New York, give notice to holders of various old securities, that the new securities and cash are ready for surrender on and after Oct. 16, under the adjustment plan. (Oct. 13, p. 720.)

CHICAGO, PEORIA & ST. LOUIS.—Judge Allen, in the U. S. Circuit Court at Springfield, Ill., on Oct. 12 issued a final decree for the sale of this property, and the St. Louis, Chicago & St. Paul, at the upset price of $500,000 on each road. (Sept. 29, p. 686.)

FLORENCE & CRIPPLE CREEK.—A Colorado Springs press dispatch states that the Midland Terminal, the Labelle Mill, Water & Power, the Colorado Trading & Transfer and the Metallic Extraction companies have been consolidated with this company under the title of the Denver & Southwestern. These lines are to be extended to Denver, 25 miles, and to Silverton, about the same distance. (April 28, p. 307.)

INDIANAPOLIS UNION.—The company will receive proposals up to Nov. 1 at the office of the Fidelity Insurance Trust & Safe Deposit Co. of Philadelphia, for $14,000 of its first mortgage bonds, at a price not to exceed par and accrued interest.

KANSAS CITY & NORTHERN CONNECTING.—A. E. Stillwell, President, has issued a circular in which he says that the condition of the company is such that a readjustment must be made before the next interest period of Jan. 1, 1900, to save the property from going into the hands of receivers. The plan suggested is that holders of first mortgage bonds shall receive 75 per cent. in new first mortgage 4s and 30 per cent. in new 4 per cent. preferred stock. Second mortgage bondholders are to receive 20 per cent. in new 4 per cent. preferred stock, and 33⅓ per cent. in new common stock. The common stock will receive four shares of new common for each seven shares of old. No assessment is called for. This company has been practically controlled by the Kansas City, Pittsburgh & Gulf, now in the hands of receivers.

KANSAS CITY, PITTSBURGH & GULF.—The State Trust Co., of New York has made application to the Federal Court at Kansas City, Mo., for a decree of sale of the property because of the default of six months' interest on the bonds. (Sept. 29, 686.)

LEAVENWORTH, TOPEKA & SOUTHWESTERN.—This property was sold at public auction Oct. 12, at Oskaloosa, Kan., to Edward Wilder, Treasurer of the Atchison, Topeka & Santa Fe, the only bidder, for $100,000. The line was a part of the old Atchison. It went into the hands of a receiver April 20, 1894. (Aug. 18, p. 590.)

MANHATTAN (ELEVATED).—The company on Nov. 1 will retire $4,000,000 of Metropolitan Elevated second mortgage 6 per cent. bonds, and will issue a like amount of its own 4 per cent. bonds, effecting a saving of $80,000 a year in interest.

MISSOURI, KANSAS & TEXAS.—Judge Townsend of the U. S. Circuit Court for the Southern District of New York, on Oct. 7, overruled the demurrer entered by the Mercantile Trust Co., New York against the company for non-payment of interest in full on the second mortgage 4 per cent. bonds, when due. The demurrer claimed that a proper account was rendered for the coupons due Aug. 31, 1891, disclosing that there were no net earnings available for the payment. As a denial of the allegations of the bill and the questions raised call for the introduction of evidence, the judge orders the overruling of the demurrer. (June 24, 1888, p. 466.)

PITTSBURGH & WESTERN.—J. P. Morgan & Co., New York, give notice to holders of first mortgage 4 per cent. bonds, that more than 80 per cent. of the bonds have been deposited with them under the terms of their notice of Dec. 14, 1898. They give notice further that they have made arrangements with the reorganization managers of the Baltimore & Ohio, whereby in case they issue any plan of reorganization of the P. & W. prior to Dec. 14, 1899, the depositors under the Morgan agreement will receive the option for at least 30 days to take par and interest in cash, or to have their bonds included in the plan on the basis of new securities. Any depositor who does not wish to await such plan may present his bond and receive par and interest in exchange. (July 7, p. 500.)

PITTSBURGH, CINCINNATI, CHICAGO & ST. LOUIS.—Jeffersonville, Madison & Indianapolis bonds to the value of $205,000 are called for payment at 110 and interest at the Farmers' Loan & Trust Co., New York. (Sept. 8, p. 634.)

SOUTHWESTERN ARKANSAS & INDIAN TERRITORY.—This property was sold at Pike City, Ark., on Oct. 10, to Grayson & McLeod, of Pike City, for $135,000. Wm. Grayson, one of the purchasers, is reported as stating that the road is to be used for developing the logging properties at Arkadelphia and Gurdon, and that the road is to be extended to Gurdon, about 2½ miles. The road went into the hands of a receiver March 9, 1896. (Aug. 4, p. 562.)

TOLEDO, ST. LOUIS & KANSAS CITY.—The U. S. Court of Appeals at Cincinnati, O., has denied the petitions for the re-hearing and it is expected that the decree of foreclosure sale will be entered at once, and the date of sale fixed. The receiver has paid all but about 140,000 of the receiver's certificates. (Aug. 18, p. 590.)

TYLER SOUTHEASTERN.—This property has been transferred to the St. Louis Southwestern under the consolidation bill, which passed the Texas Legislature last year. It runs from Tyler to Lufkin, 86½ miles. (St. L. S. W., Dec. 9, 1898, p. 887; Sept. 29, 1899, p. 686.)

TRAFFIC.

Traffic Notes.

The Union Pacific, under a contract just made with the Chicago, St. Paul, Minneapolis & Omaha, is running freight trains over the tracks of the latter between Norfolk, Neb., and Sioux City, Ia.

In consequence of the withdrawal of ships from the Atlantic trade for use by the British Government in its South African war the rates on grain from New York to Liverpool have risen to 4½d. and higher, an increase of about 50 per cent. in two weeks.

The Delaware, Lackawanna & Western is to make the price of season tickets uniform for each month. Heretofore a sliding scale has been in force, the rate for the first month of a year being much higher than that for the last month.

State Railroad Commissioner Osborne of Michigan has asked the Wayne Circuit Court to compel the Wabash Railroad to reduce its rate of fare from 3 cents a mile to 2½. The general railroad law of Michigan provides that when a road's earnings are over $2,000 per mile it can charge but 2½ cents. The last report of the Wabash showed an earning of over $2,000, and Commissioner Osborne notified the company to reduce its rate, but the company took no action.

The wholesale and jobbing merchants of San Francisco have formed the Pacific Coast Traffic Association, with the purpose of opposing the movement among the wholesalers in St. Louis, Chicago and other Eastern cities to get a reduction of rates on freight in less than carloads to the Pacific Coast. The prosperity of the jobbing merchants in California and Oregon depends largely on their ability to get large quantities of freight from the East at rates lower than are granted on small quantities, and the new association will strenuously oppose the petition which has been presented to the Interstate Commerce Commission by the St. Louis people. The Chairman of the Pacific Coast Traffic Association is H. D. Loveland.

Merchants' Freight Bureaus.

Mr. J. R. Cavanagh, Superintendent of Car Service of the Cleveland, Cincinnati, Chicago & St. Louis, has lately addressed the Board of Trade, and the Commercial Club, of Indianapolis, on the need of a transportation bureau in that city. He tells the members of these bodies that they need an experienced traffic man to look out for their interests, in the matter of favorable freight rates, and to see that other cities, especially those which already have traffic commissioners, do not get the better of Indianapolis in selling goods in competitive territory. Mr. Cavanagh, referring to the Charleston (S. C.) bureau, which is partly supported by the city, says that the Commissioner there is sometimes able to give lower rates than can be got at the railroad offices, owing to the ambiguity of the tariffs. Mr. Cavanagh quotes another traffic commissioner who says that the traffic bureau should not attempt to handle questions with individual railroads nor to secure special rates or special concessions; neither should it attempt to handle questions of minor importance. It should deal with subjects connected with the general welfare of the merchants and, the Commissioner being competent, the success of the bureau should not be gaged by the number of reductions in rates which it can secure in a given year; neither should a merchant judge it by the tangible profit to himself in a given time; the fact that the bureau exists and is constantly on the alert should be sufficient.

Chicago Traffic Matters.

Chicago, Oct. 18, 1899.

The experiment of the Central Traffic Association with its copyrighted seal on contract form excursion tickets was a great success. The joint agency has now been closed three days and no attempt to imitate the seal has yet been discovered. During the last days of the agency a little trouble was experienced, that resulted in landing two of the joint agency clerks in jail. A woman who had deposited a return ticket reading to Canton, O., over the Erie road, and who had boasted at the time of deposit that she would sell the return portion, caused the arrest of one of the clerks for refusing to deliver the return ticket to her except at the station a few minutes before the departure of her train. The other case was of a man who refused to sign his name more than once to satisfy the clerk of his identity. His ticket read to Detroit, and on refusal of the clerk to return it to him he caused the latter's arrest on the charge of larceny as bailee in the sum of $8, the value of the ticket. The woman charged the clerk with obtaining money under false pretenses, the amount alleged being fifty cents, the fee charged for handling the ticket. Neither case was prosecuted. Chairman Donald and Secretary Fort, of the Central Passenger Association, are of the opinion that the two persons who caused the arrests were either taken in tow by brokers after their trouble in the joint agent's office or were paid tools of the scalpers. The latter acknowledge that they were beaten by the seal. Chairman Donald has sent detectives to Detroit and to Ohio, to ascertain the standing of the man and woman who caused the trouble, and if it is found they are worth anything it is proposed to prosecute them for malicious prosecution and false imprisonment.

The recent action of the Central Passenger Association in voting to make a uniform charge of one-half the excess baggage rate for the transportation of bicycles is likely to be nullified by the stand that has been taken by the Baltimore & Ohio. The day after the action of the association General Passenger Agent Austin, of the Baltimore & Ohio, gave notice that his company would not be bound by the resolution, but would continue to carry wheels free. This was the only road that voted against the proposition. An effort is being made to induce the Baltimore & Ohio to change its position before the resolution is considered by the Trunk Line Association.

At last it is believed that the troublesome colonists' rates to the north Pacific coast are to come out. The general passenger agents of the Great Northern and the Northern Pacific have notified all their agents that these colonists' rates will be withdrawn Nov. 1, and that no more business must be contracted on the tariffs. This means a general advance in the second class rates, for that is all the colonists' rates have been throughout the west. Second class rates will now go back to the old figure, $40 from St. Paul to Pacific coast. The colonists' rate was $25.

Nov. 1 there will be a general advance in domestic and export grain rates from Chicago. Following are the new rates that will apply to all domestic grain:

From Chicago to New York, 22 cents; to Boston, 24; to Philadelphia, 20, and to Baltimore, 19. On export grain of all kinds the rates will be: To New York, 20 cents; to Philadelphia, 19, and to Baltimore, 18½.

Eastbound shipments of flour, grain, and provisions from Chicago and Chicago junction points to and beyond the western termini of the Trunk Lines for the four weeks ending Sept. 30 amounted to 491,021 tons, as compared with 153,738 tons for the corresponding period of last year. This statement includes 26,309 tons of flour, 399,216 tons of grain, and 65,496 tons of provisions. The following table shows the quantities and proportions carried by the respective roads:

	Tons.	P.c.
Baltimore & Ohio	59,081	10.7
Cleveland, Cincinnati, Chicago & St. Louis	43,085	8.9
Chicago & Erie	47,660	9.7
Grand Trunk	38,690	7 6
Lake Shore & Michigan Southern	76,804	15.9
Michigan Central	46,938	9.7
New York, Chicago & St. Louis	47,568	9.8
Pittsburgh, Cincinnati, Chicago & St. Louis	36,047	7.7
Pittsburgh, Ft. Wayne & Chicago	68,182	13 8
Wabash	28,766	5.9
Totals	491,021	100.0